

### 3.0 ALTERNATIVES

In accordance with NEPA and Commission Policy, we evaluated alternatives to the Millennium Project to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives include the no action or postponed action alternative, system alternatives, major route alternatives, route variations, and aboveground facility site alternatives. The full range of alternatives considered for the Millennium Project is discussed in the following section.

#### 3.1 NO ACTION OR POSTPONED ACTION

The Commission has three alternative courses of action in processing an application for a Certificate. It may: (1) grant the Certificate with or without conditions, (2) deny the Certificate, or (3) postpone action pending further study. The course of action that would best serve the public convenience and necessity will be the selected alternative.

If the Commission postpones or denies the application, the short- and long-term environmental impacts identified in this EIS would not occur. However, potential natural gas customers would be forced either to use (or continue to use) alternative fuel sources (e.g., fuel oil, coal, wood) with higher emission rates of nitrogen oxides ( $\text{NO}_x$ ) or sulfur dioxide ( $\text{SO}_2$ ) than natural gas, or to make other arrangements to obtain natural gas service. In addition, Columbia's aging Line A-5 would have to remain in service and possibly undergo testing and replacement.

Denial of the application also could prevent a potential improvement in regional air quality. Compared with other fossil fuels, natural gas is a relatively clean-burning and efficient fuel that can reduce many pollutants. For example, a natural gas turbine cogeneration plant would require about 25 percent less input energy than a combination new coal-fired electric power plant with an oil-fired boiler producing steam. A gas-fired cogeneration plant would also emit less than 1 percent of the sulfur dioxide ( $\text{SO}_2$ ), 27 percent of the particulates, and 50 percent of the nitrogen oxide ( $\text{NO}_x$ ) produced by a comparably sized conventional coal and oil-based cogeneration plant with pollution control equipment.

If the project were postponed or denied, one or more alternative natural gas projects could be implemented to provide expanded natural gas service to the region. The implementation of alternative projects would require the construction of additional and/or new pipeline facilities in the same or other locations to transport natural gas supplies. Alternative natural gas projects would result in their own set of specific environmental impacts, which could be lesser or greater than those associated with the current proposal.

In all probability, the aging Line A-5 would need to be entirely replaced over time, requiring continued construction along its 222-mile length. In 1993, the USDOT issued Columbia a hazardous waste facility order and two safety related conditions. Between 1993 and 1998, Columbia replaced about 16.1 miles of Line A-5 between MPs 39.7 and 213.8, the majority of which (13.6 miles, 84 percent) were between MPs 39.7 and 154.3, which are not included the Millennium Project. Columbia states that it has completed all pipe replacement, addressed all the concerns identified in the remedial action plans, and submitted a report to the USDOT summarizing these actions in March 1999. If the Millennium Project were not constructed, Columbia states that it would continue to monitor Line A-5 for safety and reliability, and would use additional integrity measures as necessary for the monitoring, including hydrostatic testing, smart pigging, inspection digs, and pipe replacement.

It would be purely speculative and beyond the scope of this FEIS to attempt to predict what actions may be taken by policy-makers or end users in response to the no-action or postponed-action alternative. Therefore, the assessment of impacts associated with these scenarios also would be speculative.

Other natural gas systems exist, and natural gas projects are currently proposed in the region. We have examined the potential for these systems and projects to serve as system alternatives to the proposed project (see section 3.2).

In considering Millennium's proposal, the Commission will review both the environmental and non-environmental record, including alternatives, in deciding whether issuance of a Certificate is in the public convenience and necessity (see section 1.1). This process will include weighing the non-environmental benefits associated with the project, such as the need to meet the growing fuel requirements in the northeast and mid-Atlantic region with competitively priced natural gas, against the environmental impacts associated with the proposed project, including the recommended mitigation and alternatives discussed in this FEIS.

## 3.2 PROJECT SYSTEM ALTERNATIVES

System alternatives are alternatives to the proposed action that would make use of other existing, modified, or proposed pipeline systems to meet the stated objective of the proposed project. A project system alternative would make it unnecessary to construct all or part of the proposed project, although some modifications or additions to another existing pipeline system may be required to increase its capacity, or another entirely new system may be required. Although these modifications or additions also could result in environmental impact, this impact may be less, similar to, or greater than that associated with construction of the proposed project.

The objective of identifying and evaluating system alternatives is to avoid or reduce the potential impact associated with construction and operation of the proposed facilities while still allowing the stated objective of the project to be met. Potential impact factors considered may include new right-of-way requirements, land use effects (including those associated with residences and public interest areas), stream and wetland disturbance, and effects on endangered and threatened species.

A number of commenters on the DEIS stated that other existing pipeline systems should be used to deliver Millennium's proposed natural gas volumes, including those of the Iroquois Gas Transmission System (Iroquois); Tennessee Gas Pipeline Company (Tennessee); Duke Energy (Duke) pipeline systems including the systems of Texas Eastern Transmission System (Texas Eastern) and Algonquin Gas Transmission Company (Algonquin); CNG Transmission System (CNG); Transcontinental Gas Pipe Line Corporation (Transco); and National Fuel Gas Supply Corporation (National Fuel) (see figure 3.2-1).

These companies have stated that they have significant amounts of natural gas capacity under contracts that are set to expire in the near future (over an approximate 5-year period) and that this turnback capacity offers an opportunity to make full use of existing pipeline assets to serve Millennium's customers with significantly lower environmental impacts than new construction. No specific data were filed about how much of this turnback capacity may be available, however, or where it would be located within the pipeline systems.

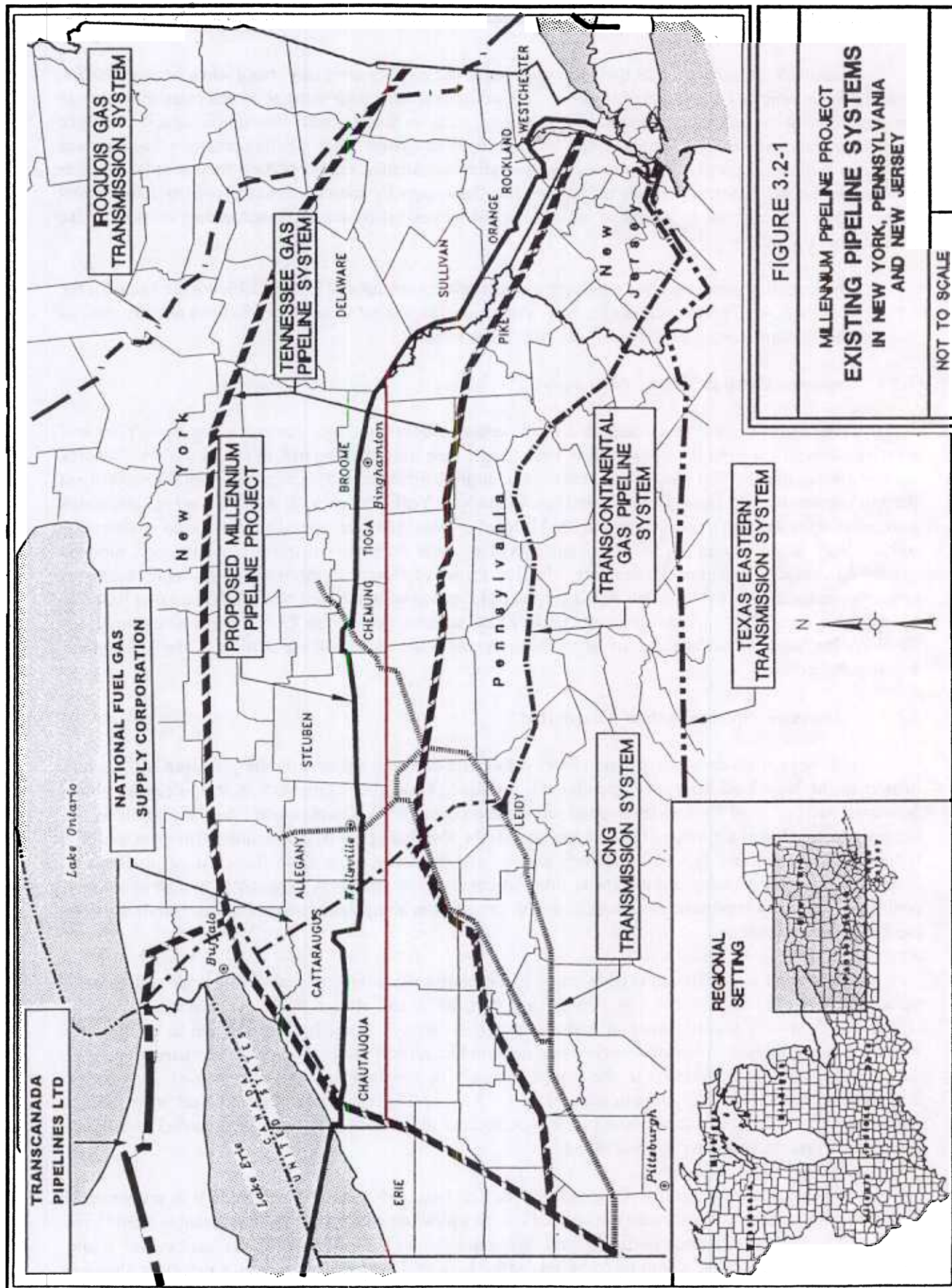


FIGURE 3.2-1

MILLENNIUM PIPELINE PROJECT  
EXISTING PIPELINE SYSTEMS  
IN NEW YORK, PENNSYLVANIA  
AND NEW JERSEY

NOT TO SCALE

Turnback capacity is capacity that is returned to the pipeline company if and when a transportation contract is not renewed at the end of its term. One of the problems with using turnback capacity to design an alternative project is that it is speculative; it is not possible to know exactly how much capacity might be turned back and where that capacity might be on a pipeline system. If a pipeline company has turnback capacity in Illinois, it may not be of use for transportation requirements in New York, for example. Another problem is that the contracts covering the potential turnback capacity are set to expire over a period of several years. Capacity may not be available when it would be needed by the proposed in-service date of the Millennium Project.

System alternative analyses conducted for the project, as defined in the DEIS, are the same for the amended project, which now includes the 9/9A Proposal. The project delivery points have not changed, so the pipeline systems used for these analyses remain the same.

#### **3.2.1 Iroquois Pipeline System Alternative**

The Iroquois pipeline extends in a northwest-southeast direction, across eastern New York and western Connecticut from the Canada/New York border near Iroquois, Ontario, to the New York City area near South Commack. The Iroquois system is in an entirely different geographic area from the majority of the Millennium Project although both terminate in the New York City area. It could not serve Columbia's customers at the existing meter stations where Millennium would deliver natural gas across the southern tier of New York State. Therefore, we did no analysis of a system alternative using only the Iroquois pipeline system to replace the entire Millennium Pipeline Project. However, Iroquois is planning a project (Eastchester Expansion Project) that would bring natural gas from Northport, New York, on Long Island to Bronx, New York. This project is currently under FERC review. See section 3.2.8, System Alternatives for the 9/9A Proposal, for an analysis of using the Iroquois system to replace a portion of the Millennium Pipeline Project.

#### **3.2.2 Tennessee Pipeline System Alternative**

Although the Tennessee system shares proximate delivery points with the proposed Millennium Project in the New York City area, maintaining service to Columbia's Line A-5 existing delivery points across the State of New York and providing service to proposed Millennium pipeline delivery points would require construction of a number of significant laterals if Columbia's Line A-5 is abandoned as proposed (see figure 1.1-1 in section 1.1). These laterals would need to extend north from the existing pipelines in Pennsylvania to the delivery points in New York. As many as 30 laterals of between 15 and 50 miles each could be required, unless these customers could be served from alternate delivery points to Columbia from the Tennessee pipeline.

Assuming the laterals would be at least 15 miles long and would require a 75-foot-wide construction right-of-way, up to 450 miles of new laterals may be needed, and at least 4,091 acres of land would be affected by their construction, much of it along new right-of-way. Additional land would be required for work spaces at waterbody, road, and railroad crossings and for topsoil storage and sidehill construction. This disturbance would be in addition to the land that would be required for any expansion of Tennessee's facilities to transport the Millennium gas volumes. Any new laterals that would connect an expanded Transco or Texas Eastern system would be longer because they are further south of Line A-5 and would affect a proportionally greater amount of land.

However, Columbia could continue to operate its Line A-5 rather than abandon it as proposed, if Millennium's proposed volumes were transported via other pipeline systems. Columbia probably would have to continue to repair and replace portions of this aging pipeline as it has been doing in recent years. While Columbia's customers could continue to be served by Line A-5, two of Millennium's proposed shippers

(North East Heat & Light [North East] in Erie County, Pennsylvania, and IBM in Westchester County, New York), and one potential new customer at the Bowline Generating Station in Rockland County, New York, could not be served. Further, any system alternative that does not include replacement of Line A-5 negates the benefits of replacing this aging pipeline which is one objective of the proposed project. Construction eventually would be needed along Line A-5, as well as along any system alternative that would entirely replace the proposed Millennium Project.

Tennessee proposed use of its existing system for the western part of the Millennium Project, specifically for those system alternatives that were considered to avoid the Lake Erie crossing. See discussion in section 3.2.4.

### 3.2.3 Duke (Texas Eastern and Algonquin) Pipeline System Alternatives

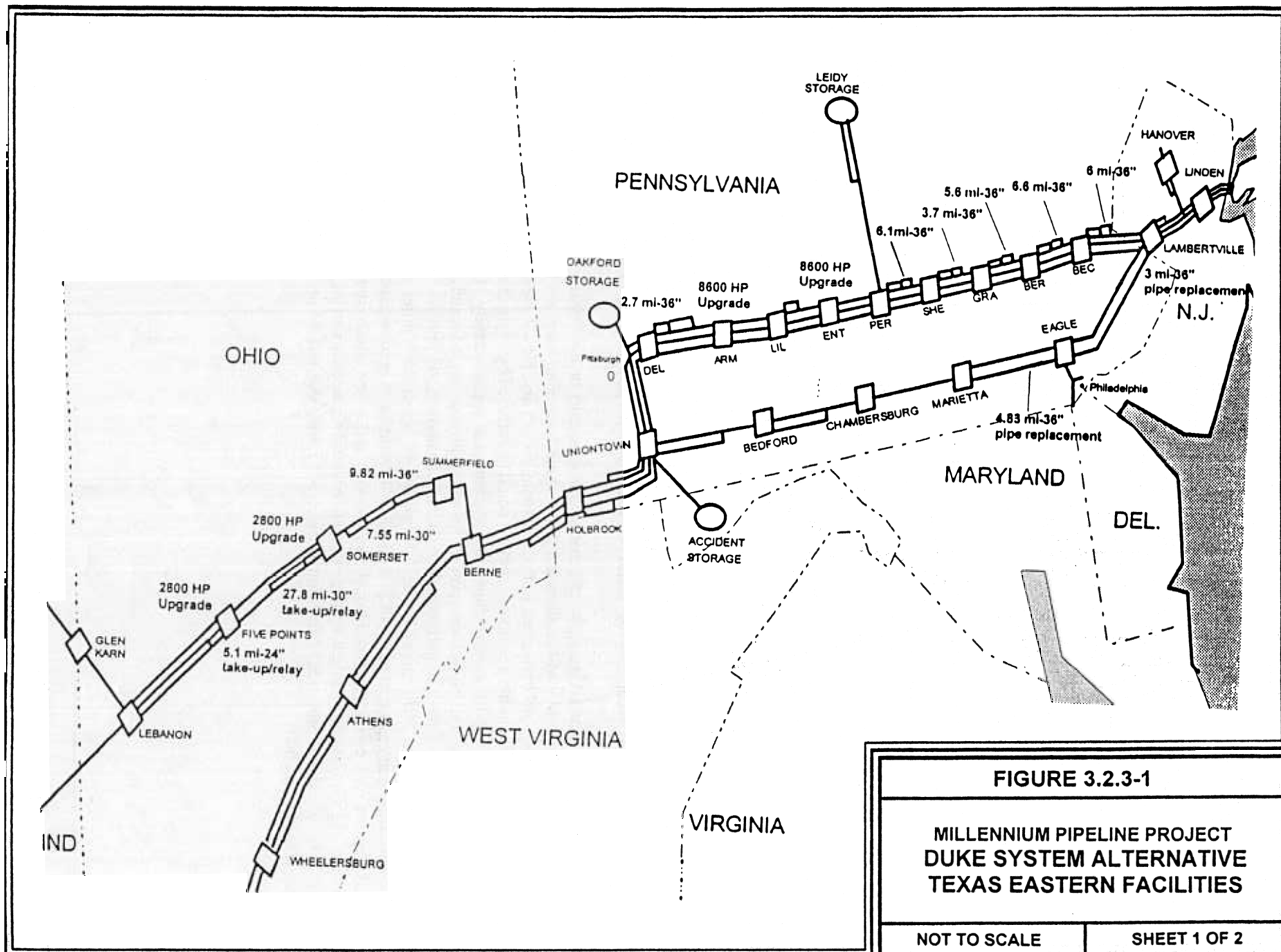
The DEIS evaluated a possible one-pipe system alternative that would transport gas on the proposed ANR Pipeline Company (ANR)/Independence Pipeline Company (Independence) systems to Leidy, Pennsylvania, with further transportation of the Millennium volumes eastward on existing and new facilities of the Texas Eastern system (see section 3.2.5.2). Duke filed comments on the DEIS in which it suggested using Texas Eastern and Algonquin facilities, along with some ANR facilities and a "Modified Millennium Project," to transport the Millennium volumes (see figure 3.2.3-1, sheets 1 and 2). Duke stated that this system alternative would use existing and anticipated turnback capacity on the Texas Eastern and Algonquin systems with additional pipeline and compressor construction.

Texas Eastern states that, based on historical observation of its system, about 25 percent of its contracts that are projected to expire would result in turnback capacity. Therefore, it designed a possible alternative based on this assumption. While this is a more conservative approach than assuming all expiring contracts would result in capacity that could be used to design a new project, it is still a speculative amount.

Texas Eastern and Algonquin state that turnback capacity on their systems would be available within the time frame proposed by Millennium and that it could be used to transport U.S. and Canadian gas from the Chicago area eastward to markets in Pennsylvania, New York, New Jersey, and the eastern U.S. They further state that Millennium's customer demand could be satisfied by using existing and projected turnback capacity combined with the construction and replacement of approximately 111 miles of pipeline loop and replacement pipeline, and 94,440 horsepower (hp) of compressor upgrades and additions at existing stations. The estimated cost of the alternative facilities would be about \$363 million. This alternative would also require a "Modified Millennium Project" consisting of about 26.9 miles of pipeline construction in Westchester County at a cost of about \$70,000,000. It would also require construction of the ANR Supply Link Project plus 6,100 hp of additional compression and a new meter station on that system. Texas Eastern/Algonquin state that their system alternative would replace the certificated Vector Pipeline Project (\$491,000,000)<sup>1/</sup>, the proposed Millennium Project (\$683,600,000), and the proposed Canadian Millennium Project (\$226,000,000).

---

The Vector Project has been constructed and was placed in service on November 2000.



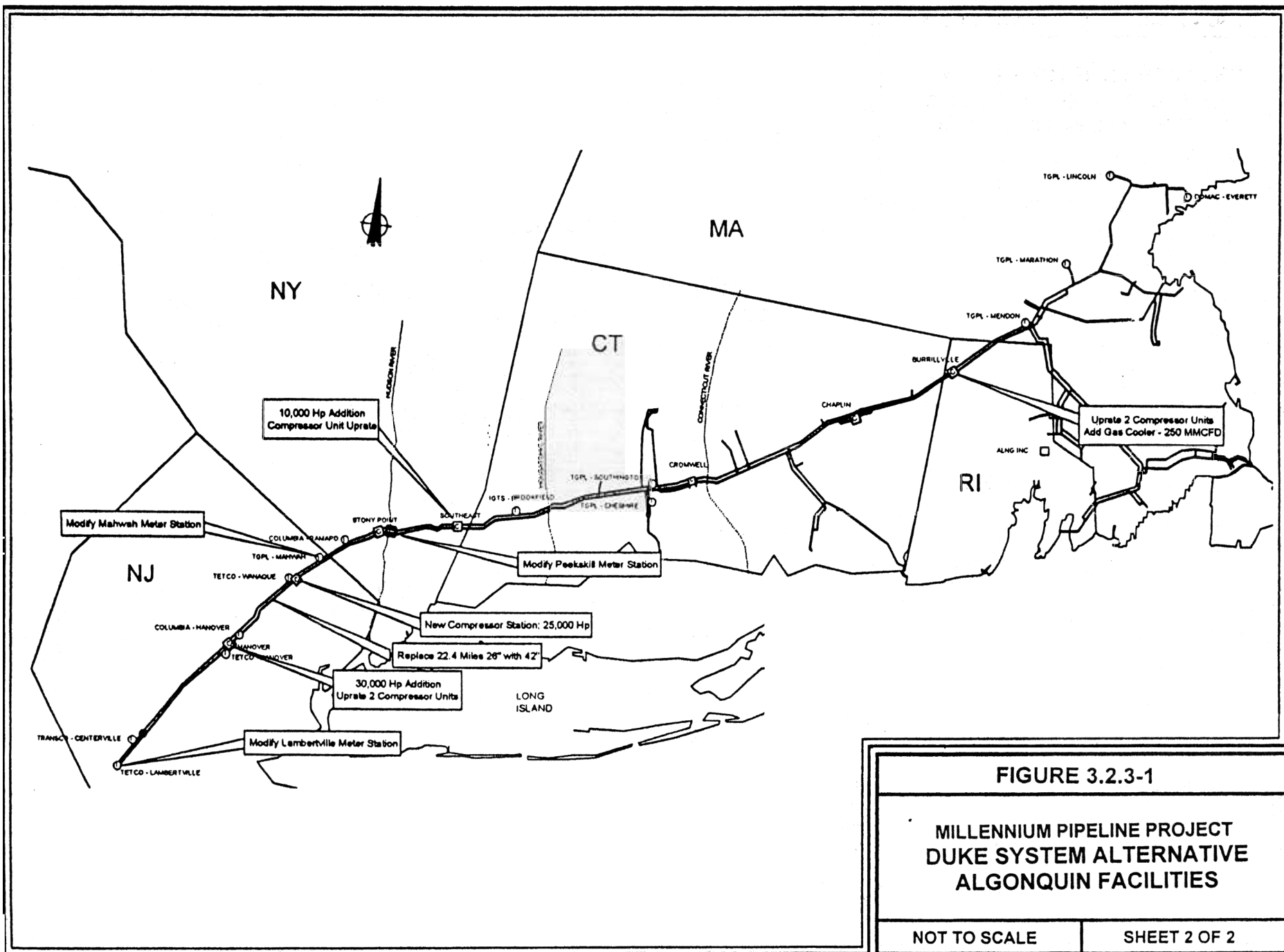


FIGURE 3.2.3-1

MILLENNIUM PIPELINE PROJECT  
DUKE SYSTEM ALTERNATIVE  
ALGONQUIN FACILITIES

NOT TO SCALE

SHEET 2 OF 2

On May 5, 1999, Texas Eastern announced the availability of 300,000 dth per day of capacity under its Spectrum Program. Without building any facilities Texas Eastern stated that it could transport 300,000 dth per day on a firm, year-round basis from an interconnection with ANR at Muncie, Indiana, to Linden, New Jersey, by using existing and turnback capacity. This would be at no incremental cost to Texas Eastern and would have no environmental or landowner impacts. Capacity could be provided directly to Millennium pipeline through a lease arrangement, for example, or directly to its shippers. The alternative facilities Texas Eastern and Algonquin would construct would be needed to provide the additional 398,200 dth per day of proposed Millennium service.

### **Staff Analysis of the Texas Eastern/Algonquin System Alternative**

The FERC engineering staff evaluated the Texas Eastern/Algonquin System Alternative. Texas Eastern's and Algonquin's joint alternative would utilize existing and projected turnback capacity in conjunction with incremental expansions of Texas Eastern's and Algonquin's existing systems to provide Millennium's proposed 700,000 dth per day of firm transportation to the New York metropolitan area. Texas Eastern and Algonquin would construct the following facilities to replace Millennium.

#### **Texas Eastern's Proposed Alternative Facilities:**

91.18 miles of pipeline loop and replacement pipe (\$173,232,000), including:<sup>2/</sup>

- 5.1 miles of 24-inch-diameter pipeline loop between Compressor Stations 17 and 18 in Pickaway and Fayette Counties, Ohio;
- 27.8 miles of 30-inch-diameter pipeline loop between Compressor Stations 17 and 18 in Fairfield and Perry Counties, Ohio;
- 7.55 miles of 30-inch-diameter pipeline loop between Compressor Stations 18 and 19 in Morgan County, Ohio;
- 9.82 miles of 36-inch-diameter pipeline loop between Compressor Stations 18 and 19 in Noble and Muskingum Counties, Ohio;
- 4.38 miles of 36-inch-diameter pipe replacement of existing 20-inch-diameter pipe between Compressor Stations 24 and 25 in Chester County, Pennsylvania;
- 3.00 miles of 36-inch-diameter pipeline loop between Compressor Stations 25 and 26 in Hunterdon County, New Jersey;
- 5.54 miles of 36-inch-diameter pipeline loop between the Entriiken and the Perulack Compressor Stations in Juniata County, Pennsylvania;
- 6.10 miles of 36-inch-diameter pipeline loop between the Perulack and the Shermans Dale Compressor Stations in Juniata and Perry Counties, Pennsylvania;
- 3.70 miles of 36-inch-diameter pipeline loop between the Shermans Dale and Grantville Compressor Stations in Perry County, Pennsylvania;

<sup>2/</sup>

Our analysis of Texas Eastern's proposal identified two discrepancies between Texas Eastern's June 7, 1999, comments on the Millennium DEIS and its July 2, 1999, response to staff's data request: (1) the input and output files submitted with Texas Eastern's July 2, 1999, filing included a replacement of 10.41 miles of 30-inch-diameter pipeline with 36-inch-diameter pipeline between its Entriiken and Perulack Compressor Stations in Pennsylvania. This pipeline replacement conflicted with the flow diagrams in the same filing and was not included in the June 7, 1999, filing; and (2) the July 2, 1999, filing removed 2.7 miles of 36-inch-diameter pipeline loop from the discharge side of the Delmont Compressor Station as originally proposed in its June 7, 1999, filing. We determined that 5.54 miles of 36-inch-diameter pipeline loop between the Entriiken and Perulack Compressor Stations would provide the same efficiencies produced by the 10.41 miles of 36-inch-diameter pipeline replacement presented in the computer models filed by Texas Eastern on July 2, 1999. Therefore, in lieu of the pipeline replacement, we have increased the required pipeline loop in Texas Eastern's and Algonquin's proposal from 110.73 miles to 113.57 miles (5.54 miles minus 2.7 miles) to correct the discrepancies in Texas Eastern's engineering design.

5.60 miles of 36-inch-diameter pipeline loop between the Grantville and Bernville Compressor Stations in Lebanon County, Pennsylvania;  
 6.59 miles of 36-inch-diameter pipeline loop between the Bernville and Bechtelsville Compressor Stations in Berks County, Pennsylvania; and  
 6.00 miles of 36-inch-diameter pipeline loop between the Bechtelsville Compressor Station and Compressor Station 26 in Hunterdon County, New Jersey.

22,800 hp of compression (\$19,060,000), including:

2,800 hp of additional compression at Compressor Station 17 in Pickaway County, Ohio;  
 2,800 hp of additional compression at Compressor Station 18 located in Perry County, Ohio;  
 8,600 hp of additional compression at the Armagh Compressor Station in Indiana County, Pennsylvania; and  
 8,600 hp of additional compression at the Entriiken Compressor Station in Huntingdon County, Pennsylvania.

#### Algonquin's Proposed Alternative Facilities

22.39 miles of replacement pipeline (\$76,031,000):

22.39 miles of 42-inch-diameter pipeline (replacing a 30-inch-diameter pipe) between the Hanover and Wanaque Compressor Stations in Morris and Passaic Counties, New Jersey.<sup>3/</sup>

67,900 hp of compression (\$85,216,000), including: <sup>4/</sup>

15,300 hp additional compression on the low pressure line at the existing Hanover Compressor Station in Morris County, New Jersey;  
 15,300 hp additional compression on the high pressure line at the existing Hanover Compressor Station in Morris County, New Jersey;  
 2,340 hp compression uprate of the existing compressors on the high pressure line at the existing Hanover Compressor Station in Morris County, New Jersey;  
 24,960 hp additional compression at a new compressor station (Wanaque Compressor Station) on the high pressure line in Passaic County, New Jersey;  
 3,000 hp additional compression on the high pressure line at the existing Southeast Compressor Station in Putnam County, New Jersey; and  
 7,000 hp additional compression on the high pressure line at the existing Burrillville Compressor Station in Providence County, Rhode Island.

3 meter station modifications (\$8,315,000), including:

modification of the existing Lambertville, Mahwah, and Peekskill Meter Stations in Hunterdon and Passaic Counties, New Jersey, and Westchester County, New York.

<sup>3/</sup> Algonquin would also replace 22.39 miles of its 26-inch-diameter mainline in Morris and Passaic Counties, New Jersey, with the existing 30-inch-diameter pipeline which would be replaced by the 42-inch-diameter pipeline.

Algonquin's submitted design called for a 9,660 hp compressor addition at the Southeast Compressor Station. Our review of the design determined that only a 3,000 hp addition is required at the Southeast Compressor Station. However, we find that a 7,000 hp compressor addition would also be required at the Burrillville Compressor Station.

Total Proposed Alternative Texas Eastern/Algonquin Facilities

The Texas Eastern/Algonquin System Alternative to the entire proposed Millennium Project would require a total of 135.96 miles of pipeline loop and replacement pipe and 90,700 hp of compression at existing and new compressor stations on the Texas Eastern and Algonquin systems. It would also require construction of the "Modified Millennium Project" and facilities on ANR's system, which have not been identified by Duke. We estimate that the cost of these facilities would be (less unknown costs for facilities on ANR):

Texas Eastern	\$ 192,292,000
Algonquin	169,562,000
"Modified Millennium"	<u>70,000,000</u>
Total	\$ 431,854,000

Texas Eastern would use a combination of new and turnback capacity<sup>5/</sup> to transport Millennium's volumes (700,000 dth per day) from Texas Eastern's interconnect with ANR at Muncie, Indiana, to its interconnects with Columbia on the CRP Line at Meter and Regulating Station 70011 (Phoenixville) in Chester County, Pennsylvania, and Algonquin on the Penn-Jersey Line at Metering and Regulating Station 70087 (Lambertville) in Hunterdon County, New Jersey.<sup>6/</sup> Texas Eastern would drop off 42,000 dth per day to Columbia, with the remaining volumes transported to Algonquin. Algonquin would then use new and turnback capacity<sup>7/</sup> to transport the Millennium volumes to interconnects with Columbia (at Ramapo in Rockland, County, New York), Tennessee (at Mahwah in Passaic County, New Jersey), and ConEd (at Peekskill in Westchester County, New York).

We conclude that the Texas Eastern/Algonquin System Alternative would cost substantially less than the \$683,600,000 cost of the proposed Millennium Project. However, we find that this alternative is not well defined for two reasons. First, neither Texas Eastern nor Algonquin identified the facilities that ANR would need on its Southeast Mainline. Second, Texas Eastern and Algonquin relied on speculative turnback capacity to design this alternative.

Because we have very little information on ANR's Southeast Mainline, we cannot determine the facilities ANR would need to construct. However, we do know that it would require a physical reversal in the flow of the line to deliver the 700,000 dth per day of Canadian volumes to the Muncie Interconnect.<sup>8/</sup>

---

Texas Eastern uses a combination of noticed turnback capacity and capacity from contracts that are expiring between now and 2000 in its alternative. We believe that the capacity from expiring contracts is speculative because the existing shippers have the right of first refusal for it. See Attachment 2 of Texas Eastern's July 2, 1999, filing for a breakdown, by pipeline segment, of the noticed and prospective turnback capacity used in Texas Eastern's design.

Texas Eastern stated that ANR would need to install additional compression at ANR's Muncie Compressor Station in Delaware County, Indiana, and that ANR would need to construct additional facilities on other parts of its system. We did not analyze ANR's system because Texas Eastern did not identify these facilities nor provide any flow diagrams and computer models of ANR's Southeast Mainline and ANR's portion of the Lebanon Extension which connect to Texas Eastern's system.

Algonquin uses a combination of noticed turnback capacity and capacity from contracts that are expiring between now and 2000 in its alternative. We believe that the capacity from expiring contracts is speculative because the existing shippers have the right of first refusal for it. See Attachment 3 of Algonquin's July 2, 1999, filing for a breakdown, by pipeline segment, of the noticed and prospective turnback capacity used in Algonquin's design.

This is necessary because ANR designs its system on a forward haul basis and does not incorporate backhauls into its system design.

In regards to the speculative turnback capacity, Texas Eastern states that it has made a conservative estimate of the projected turnback capacity that can be made available by November 1, 2000, based on its "knowledge of what is occurring in its customer's markets." Texas Eastern stated that it assumed that 25 percent of the capacity available from expiring contracts would be turned back and available for the Millennium alternative on November 1, 2000. Regardless of Texas Eastern's claims that its estimate of turnback capacity is conservative, its system design still relies on capacity that has not been noticed for turnback.<sup>2/</sup>

Because of the uncertainty with respect to turnback capacity in Texas Eastern's facilities design, we developed a "worst case" variation of the Texas Eastern/Algonquin System Alternative that would not rely on speculative turnback capacity. Under this variation, Texas Eastern and Algonquin would need to construct the following facilities in addition to the facilities listed above to move the Millennium volumes without relying on unnoticed turnback capacity:

Worst Case Texas Eastern/Algonquin Alternative

Texas Eastern Pipeline: 185.72 miles of pipeline loop (\$398,193,154), including:

- 20.81 miles of 36-inch-diameter pipeline loop between the Gas City and Glen Karn Compressor Stations in Grant County, Indiana, and Darke County, Ohio;
- 41.2 miles of 36-inch-diameter pipeline loop between the Glenn Karn Compressor Station and Compressor Station 16 in Drake and Preble Counties, Ohio;
- 8.0 miles of 36-inch-diameter pipeline loop between Compressor Stations 16 and 17 in Warren County, Ohio;
- 2.75 miles of 36-inch-diameter pipeline loop between Compressor Stations 17 and 18 in Pickaway and Fairfield Counties, Ohio;
- 9.28 miles of 36-inch-diameter pipeline loop between the Berne and Holbrook Compressor Stations in Monroe County, Ohio;
- 20.02 miles of 36-inch-diameter pipeline loop between the Holbrook Compressor Station and Compressor Station 21 in Fayette and Greene Counties, Pennsylvania;
- 16.81 miles of 36-inch-diameter pipeline loop between Compressor Station 21 and the Delmont Compressor Station in Fayette County, Pennsylvania;
- 6.94 miles of 36-inch-diameter pipeline loop between the Delmont and the Armagh Compressor Stations in Indiana County, Pennsylvania;
- 9.45 miles of 36-inch-diameter pipeline loop between the Armagh and Lilly Compressor Stations in Indiana and Cambria Counties, Pennsylvania;
- 8.71 miles of 36-inch-diameter pipeline loop between the Lilly and Entriken Compressor Stations in Cambria and Blair Counties, Pennsylvania;
- 12.80 miles of 36-inch-diameter pipeline loop between the Entriken and Perulack Compressor Stations in Huntingdon County, Pennsylvania;
- 5.33 miles of 36-inch-diameter pipeline loop between the Perulack and Shermans Dale Compressor Stations in Perry County, Pennsylvania;
- 4.65 miles of 36-inch-diameter pipeline loop between the Shermans Dale and Grantville Compressor Stations in Dauphin County, Pennsylvania;
- 6.82 miles of 36-inch-diameter pipeline loop between the Grantville and Bernville Compressor Stations in Lebanon and Berks Counties, Pennsylvania;

<sup>2/</sup> We note that Algonquin to a lesser extent relied on prospective turnback capacity to design its facilities. Algonquin did not explain how it determined how much capacity would be turned back in the future.

5.01 miles of 36-inch-diameter pipeline loop between the Bernville and Bechtelsville Compressor Stations in Berks County, Pennsylvania;  
 7.14 miles of 36-inch-diameter pipeline loop between the Bechtelsville Compressor Station and Compressor Station 26 in Bucks County, Pennsylvania, and Hunterdon Counties, New Jersey.

Texas Eastern Compression: 3,900 hp (\$3,260,254), including:

2,300 hp of additional compression at the Glen Karn Compressor Station in Darke County, Ohio; and  
 1,600 hp of additional compression at the Berne Compressor Station in Noble County, Ohio.

Algonquin Compression: 3,000 hp (\$3,385,000):

3,000 hp additional compression at the Hanover Compressor Station in Morris County, New Jersey.

In addition to the facilities required for the Texas Eastern/Algonquin System Alternative (which is dependent on speculative, prospective turnback capacity), we find that Texas Eastern and Algonquin would need 185.72 miles of pipeline loop and 6,900 hp of compression at existing compressor stations if this prospective turnback capacity does not become available. We estimate that the additional facilities for our "worst case" variation of the Texas Eastern/Algonquin System Alternative would cost:

Texas Eastern	\$ 398,193,000
Algonquin	<u>3,385,000</u>
Total	\$ 401,578,000

The total facilities required for a system alternative using Texas Eastern and Algonquin facilities to replace the entire Millennium Project is a summation of the "worst case" variation and the facilities needed for the alternative which assumes the use of turnback capacity. The total pipeline construction required would be 321.68 miles, and the additional compressor additions would total 97,600 hp, including the construction of a new compressor station.

When added to Texas Eastern's and Algonquin's proposed alternative cost of \$431,854,000 we estimate the total cost to Millennium of a worst case Texas Eastern/Algonquin System Alternative that does not use speculative turnback capacity at \$833,432,000. This exceeds Millennium's estimated cost of \$683,600,000 by \$148,832,000. Because the cost differential is excessive and neither Algonquin nor Texas Eastern identified the facilities that would be required on ANR, we conclude that a Texas Eastern/Algonquin system alternative is inferior to Millennium's proposal.

### 3.2.4 Lake Erie System Alternatives

The COE requested that we evaluate alternatives that would avoid the proposed Lake Erie crossing. Therefore, the Commission's engineering staff evaluated several system alternatives that would require the expansion of various combinations of existing facilities owned by National Fuel, CNG, and Tennessee. The U.S. portion of these system alternatives would originate at the Canada/U.S border north of Buffalo, New York, and would require additional pipeline construction (looping and/or new right-of-way) and compression at either existing or new compressor stations along various segments of these existing pipelines. The alternative would use Tennessee's existing Niagara Import Point at the international border. Initial transportation would be via Tennessee's facilities, which would deliver 8 MMcf/d to National Fuel for final delivery to North East, Millennium's shipper in Erie County, Pennsylvania. Further, our analysis did not

include estimates of the facilities that would be required in Canada to deliver the Millennium volumes to Tennessee's Niagara Import Point nor the costs for such facilities. However, in the DEIS we estimated that up to 164 miles of alternative pipeline routing, and possibly additional compression, would be required in Canada between Dawn, Ontario, and the Niagara Import Point.

None of the pipeline companies who own the facilities evaluated in the DEIS were involved in developing the system alternatives presented in that document, nor had they proposed alternative projects to transport the Millennium gas volumes. Our analysis in the DEIS was based on information filed with the Commission in other cases about the capacity and operation of these pipeline systems. We stated that there might be operational constraints and service requirements on these systems that would preclude developing these possible system alternatives. Further, the locations and sizes of the suggested facilities might change because of these unknown requirements. However, based on the information we had at hand, all of the systems evaluated would require construction of additional pipeline capacity and compression since the existing systems do not have sufficient available capacity to transport the Millennium gas volumes.

However, in their comments on the DEIS, and at the request of Commission staff, National Fuel, CNG, and Tennessee provided suggestions about how their pipeline systems might be used and modified to serve as system alternatives to the proposed Millennium Project. None of the suggested system alternatives are projects for which any of these companies have filed applications for construction with the Commission.

The following section presents a discussion of the Canadian Lake Erie System Alternative; the U.S. Niagara Spur System Alternative, as presented in the DEIS; Tennessee's U.S. Niagara Spur System Alternative; and National Fuel's U.S. Niagara Spur System Alternative. See section 3.3.1 for discussion of the major route alternatives for Lake Erie.

#### **3.2.4.1 Canadian Niagara Spur System Alternative**

All of the Lake Erie system alternatives would require the use of the Niagara Import Point near Buffalo, New York, and would require modification of the proposed Canadian Millennium Project facilities. The proposed Canadian Millennium Project would begin at the interconnection with TransCanada's mainline facilities at Dawn, Ontario. From Dawn, St. Clair would construct about 46 miles of 36-inch-diameter pipeline to the shore of Lake Erie near Patrick Point, Ontario. From Patrick Point, TransCanada would construct 60.4 miles of 36-inch-diameter pipeline to the interconnection with the Millennium Project at the international border in Lake Erie. The total capital cost for the Canadian Millennium Project is estimated to be \$230,100,000 (U.S. dollars).

TransCanada states that the Canadian portion of an alternative that would interconnect with the Niagara Spur System Alternative would begin at an interconnection with its mainline facilities in Dawn, Ontario. From Dawn, the Canadian Niagara Spur System Alternative would follow Union Gas Ltd.'s (Union) Trafalgar system northeast to an interconnection with TransCanada's facilities in Kirkwall. From Kirkwall, the alternative would follow the TransCanada system first south, to avoid residential areas near the cities of Hamilton and St. Catharines, then east and north to the Niagara Spur Import Point.

To accommodate the Millennium volumes, Union would be required to construct about 53 miles of 48-inch-diameter pipeline looping. Union's Trafalgar system traverses predominantly agricultural lands. No new right-of-way would be required. The estimated cost for the new Union facilities would be about \$141,800,000.

TransCanada would be required to construct about 57.8 miles of 42-inch-diameter pipeline loop to accommodate the incremental Millennium volumes. From Kirkwall to Mainline Valve 1302 (15.5 miles), TransCanada's system is in a relatively uncongested area with no new right-of-way anticipated for the

additional loop. However, from Mainline Valve 1302 to 213 (42.8 miles), TransCanada states that its system is in a highly congested powerline corridor that crosses through residential areas near Hamilton and St. Catharines, fruit and wine producing agricultural areas, and recreational areas including a golf course. The existing right-of-way through this area could not accommodate the looping required by the Canadian Niagara Spur System Alternative. Therefore, about 42.3 miles of new right-of-way would need to be secured. This would have an additional adverse environmental impact because the route would traverse environmentally sensitive national parks including the Niagara Escarpment Biosphere Reserve.<sup>10/</sup> The estimated cost of the TransCanada facilities would be about \$102,900,000.

The proposed project and system alternative pipelines are similar in length. The Canadian Millennium Project would require 106.4 miles of 36-inch-diameter pipeline from Dawn to the Canada/U.S. border. The Canadian Niagara Spur System Alternative would require 53 miles of 48-inch-diameter loop on Union's system and 57.8 miles of 42-inch-diameter on the TransCanada system, of which 42.3 miles would be on new right-of-way, for a total of 110.8 miles of pipeline.

TransCanada states that the distance of the land-based versus water-based construction of the two alternatives is an important consideration. Land-based pipeline construction presents a number of potentially more difficult issues than in-water construction. The number of difficult infrastructure crossings, landowner issues, and sensitive land uses increase along the length of the overland route. When compared to the National Fuel Niagara Spur System Alternative (see section 3.2.4.2), the total amount of pipeline construction proposed for the combined U.S. and Canadian portions of the Millennium Project would be about 223.4 miles (117 miles in the U.S. and 106.4 miles in Canada). Of this total, land-based construction would be about 130.1 miles (84.1 miles in the U.S. and 46 miles in Canada). TransCanada states that the proposed route was selected because it would not result in significant environmental impacts and would not have any operational impacts that could not be safely managed.

TransCanada further states that the proposed Millennium Project better meets two additional routing criteria. First, pipeline rights-of-way, to the extent possible, should be located in areas so as to be least visible from areas of public view (see 18 CFR section 2.69). The Millennium Project's routing through Lake Erie, versus the Canadian Niagara Spur System Alternative's routing through densely populated, wine producing, and recreational areas in Canada, is less visible to the public and therefore preferable. Second, to the extent possible, pipeline construction should follow existing right-of-way. About 40 percent of the Canadian Niagara Spur System Alternative would require new right-of-way through congested and sensitive land use areas.

Construction of the Canadian Niagara Spur System Alternative would cost about \$244,720,000, an increase of about \$14,580,000 over the Canadian Millennium Project's capital costs. The estimated cost for construction of the proposed Canadian Millennium Project would be about \$230,140,000.

TransCanada states that the increased capital cost of the Canadian Niagara Spur System Alternative and the routing to an alternative delivery point off TransCanada's system presents a significant toll impact on TransCanada's shippers. TransCanada's tolls are distance-based, and costs are allocated on a rolled-in basis. Changing the delivery point from the interconnect with Millennium at the international border in Lake

---

In 1990, the United Nations Educational, Scientific and Cultural Organization named the Niagara Escarpment a World Biosphere Reserve. Biosphere reserves demonstrate a balance between conservation and development and must have protected core areas that conserve significant ecological features. On the Niagara Escarpment, the core area consists of Niagara Escarpments Parks, portions of the Bruce Peninsula National Park and Fathom Five National Marine Park, and portions of land owned by the Niagara Parks Commission. Land use and development within the Niagara Escarpment Biosphere Reserve is addressed in the Niagara Escarpment Plan and is under the jurisdiction of Canadian agencies.

Erie to the Niagara delivery point would result in an increase in TransCanada's toll for Millennium shippers. TransCanada estimates that shippers transporting gas from the interconnect at Dawn to Niagara would expect toll increases from 10.13 cents to 12.4 cents per gigajoule. Shippers moving gas from the Western Canadian Sedimentary Basin to Niagara would expect even more significant toll increases. This is an issue that would be addressed by the NEB in its evaluation of the Canadian portion of the project.

We cannot verify TransCanada's indicated alternative facilities because we have no pipeline engineering data for that system. Nor can we comment on the possible environmental impact of the proposed Canadian Millennium Project or on any alternative Canadian facilities other than that the proposed alternative facilities would impact national parks within the Niagara Escarpment Biosphere Reserve. The NEB will evaluate the proposed Canadian Millennium Project, including alternatives to the proposed Lake Erie crossing. If the Commission issues a certificate for the Millennium Project in the U.S., Millennium would not be permitted to begin construction until after the NEB issues a permit for the Canadian portion of the project.

### 3.2.4.2 DEIS U.S. Niagara Spur System Alternative

FERC staff evaluated the facilities that could be needed to transport gas from the Niagara Import Point at the Niagara River to an interconnection with the proposed Millennium pipeline in New York and presented the results of this analysis in the DEIS. This alternative would bypass Lake Erie and would replace a total of about 144 miles of the proposed Millennium Project in Lake Erie and Chautauqua, Cattaraugus, and Allegany Counties (about 114.1 miles of this total would be onshore). Additional Canadian facilities that would not be built would include the 46.0-mile-long St. Clair pipeline and 60.4 miles of the Lake Erie pipeline crossing in Canadian waters that would be constructed by TransCanada. No new compression is proposed for the Millennium Project; however, any system alternative that would transport gas from the Niagara Import Point to the proposed project in Allegany County would require additional compression. We compared the estimated costs of the evaluated system alternatives with an estimated cost of about \$235,000,000 for the portion of the Millennium Project that the alternatives would replace. The U.S. Niagara Spur System Alternative presented in the following section may be economically viable, but would have to be considered in conjunction with the Canadian Niagara Spur System Alternative.

The U.S. Niagara Spur System Alternative would require Tennessee to transport 700,000 dth per day from the Niagara Import Point on its Niagara Spur to an intersection with National Fuel at the East Aurora Delivery Point (East Aurora) in Erie County, New York. National Fuel would transport 8 MMcf/d to North East. The remaining Millennium gas volume of 692,000 dth per day would be transported by National Fuel to an interconnection with the proposed Millennium pipeline route in Allegany County, New York. Millennium would then transport the 692 dth per day to its other shippers as proposed. The U.S. Niagara Spur System Alternative may require the construction of the following facilities on these pipeline systems:

#### Tennessee facilities:

- 3.7 miles of 42-inch-diameter pipeline loop extending downstream of the Niagara Import Point on the Niagara Spur in Niagara County, New York;
- an 11,000 hp compressor addition at the Lockport Compressor Station in Erie County, New York; and
- 24.8 miles of 42-inch-diameter pipeline loop extending downstream of the Lockport Compressor Station on the Niagara Spur in Erie County, New York.

#### National Fuel facilities:

55.6 miles of 42-inch-diameter pipeline loop in Erie, Cattaraugus, and Allegany Counties, New York, between East Aurora and the interconnection with Millennium in Allegany County, New York; and  
an 18,000 hp compressor addition at the existing Concord Compressor Station in Erie County, New York.

The total estimated facilities and costs, exclusive of fuel costs, for the U.S. Niagara Spur System Alternative are about \$222,780,000 for 94.0 miles of 42-inch-diameter pipeline at \$2,000,000 per mile (\$187,980,000) and 29,000 hp of compression at \$1,200 per hp (\$34,800,000). This is about \$12,000,000 less than the corresponding segment of the proposed project based on preliminary analysis.

The U.S. Niagara Spur System Alternative would require construction of about 53.3 fewer miles of pipeline in the U.S. (about 20.4 fewer miles of onshore pipeline construction), but would require the expansion of two existing compressor stations, both in Erie County, New York. About 106.4 miles of proposed Canadian facilities would not go forward; however other Canadian facilities would need to be constructed for this alternative, which are estimated at \$244,720,000 (see section 3.2.4.1). TransCanada states that the Canadian Niagara Spur System Alternative would cost \$14,580,000 more than the proposed Canadian Millennium Project, which would cancel out the cost savings on the U.S. side (estimated at \$12,000,000) when considering the entire system alternative from Dawn, Ontario, to an interconnection with the proposed U.S. Millennium pipeline at MP 143.8 in Allegany County, New York. In the DEIS, we requested comments from Tennessee and National Fuel about the feasibility of constructing a system alternative from the Niagara Import Point to an interconnection with the proposed Millennium pipeline in Allegany County, New York. Their proposed system alternatives are presented in sections 3.2.4.3 and 3.2.4.4.

#### 3.2.4.3 Tennessee's U.S. Niagara Spur System Alternative

Tennessee states that, while the alternative presented in the DEIS is feasible, it is capable of providing a system alternative to the Millennium Project for a range of volumes up to 700,000 dth per day that would require fewer facilities. To do this, it would maximize use of backhaul transportation, existing pipeline corridors, and the addition of incremental compression. Tennessee states that it has the flexibility to provide either the total 700,000 dth per day of service or to phase-in the capacity over time. This phase-in approach would allow capacity to be constructed as the market develops, thereby eliminating overbuilding concerns and unnecessary adverse impacts on the environment. Further, Tennessee states that its alternative would eliminate significant upstream greenfield pipeline construction along with associated environmental and landowner concerns.

Tennessee has evaluated two specific system alternatives scenarios: a 700,000 dth per day and a 300,000 dth per day scenario. Both proposals would eliminate facilities downstream of East Aurora and deliver gas to Millennium at Greenwood, Steuben County, New York, at approximate MP 157.9 on the proposed Millennium pipeline. This would be further east than the National Fuel interconnection with Millennium at MP 143.8, as suggested in the DEIS. Tennessee would use its existing Niagara Spur, 200-Line, 300-Line, and 400-Line pipelines to provide this service. Tennessee states that it shares proximate delivery points with the proposed Millennium Project in the New York City area. To maintain service to Columbia's existing delivery points across New York that are currently served by Line A-5, Tennessee would only need to build short laterals or provide alternative delivery points to Columbia from the existing Tennessee system. Tennessee did not, however, evaluate construction of these lateral in its comments.

Tennessee states that although looping of a portion of the Niagara Spur would be required, there is adequate Niagara River crossing capacity. It also states that it understands that there will be significant contract expirations on the TransCanada system service eastern Canada over the next several years. This is

in conflict with information filed by TransCanada that states that additional Canadian facilities would be required to deliver gas at the Niagara Import Point. Tennessee assumes that no facilities would be constructed in Canada to move the natural gas to Niagara Import Point. TransCanada has filed conflicting information which is discussed above in section 3.2.4.1.

Tennessee suggested both a 300,000 dth per day and a 700,000 dth per day alternative to the western portion of the Millennium Project.<sup>11/</sup> We did not analyze the 300,000 dth per day alternative because Millennium's proposal is for 700,000 dth per day of firm transportation. Tennessee's 700,000 dth per day alternative would use a combination of existing unused capacity, prospective turnback capacity, and new capacity on its Niagara Spur Line, 200-Line, 300-Line, and 400-Line to transport gas from the Niagara Import Point in Niagara County, New York, to a proposed interconnection with Millennium on Tennessee's HC-Line at Millennium MP 157.9 in Steuben County, New York. This alternative also depends on operational changes on the Tennessee system, such as the use of backhauls. As part of this system alternative, Tennessee's alternative includes the construction of the following facilities:

63.3 miles of pipeline loop:

- 40.0 miles of 36-inch-diameter pipeline loop on the Niagara Spur Line extending downstream from Compressor Station 230-C through Niagara and Erie Counties, New York;
- 11.3 miles of 30-inch-diameter pipeline loop on the 200-Line extending upstream of Compressor Station 233 through Livingston and Wyoming Counties, New York;
- 12.0 miles of 30-inch-diameter pipeline loop on the 200-Line extending upstream of Compressor Station 237 in Ontario, New York;

68,000 hp of compression:

- 8,000 hp additional compression at the existing Compressor Station 230-C on the Niagara Spur Line in Niagara County, New York;
- 3,000 hp additional compression at the existing Compressor Station 237 on the 200-Line in Ontario County, New York;
- 12,000 hp additional compression at the existing Compressor Station 313 on the 300-Line in Potter County, Pennsylvania;
- 15,000 hp of new compression at a new compressor station at Mainline Valve 304 on the 300-Line in Venango County, Pennsylvania;
- 15,000 hp of new compression at a new compressor station at Mainline Valve 310 in McKean County, Pennsylvania; and
- 15,000 hp of new compression at a new compressor station at the Greenwood interconnect with Millennium on the HC Line in Steuben County, New York.

Tennessee estimates that these facilities (68,000 hp of compression and 63.3 miles of pipeline loop) would cost \$212,597,000 as opposed to \$252,900,428 for the 157.9 miles of Millennium that would not be required with the Tennessee alternative.<sup>12/</sup> See figure 3.2.4.3-1 for a map showing the location of the required facilities.

<sup>11/</sup> For this alternative, Tennessee would replace the western portion of the Millennium Project that extends from the international boundary in Lake Erie to the proposed pipeline in Steuben County, New York (MP 0.0 to 157.9).

<sup>12/</sup> Tennessee did not provide a breakdown of the costs for each facility. The Millennium cost estimate comes from Exhibit K of Millennium's application (\$602,860,806 for 376.4 miles of 36-inch diameter pipe).

For its 700,000 dth per day alternative, Tennessee assumed that 612,000 dth per day of new natural gas would enter the U.S. at the Niagara Import Point and would move down the Niagara Spur Line to its interconnect with the 200-Line using new capacity. At this interconnect, 200,000 dth per day would be transported via a forward haul along the 200-Line and HC-Line to the Greenwood interconnect using new capacity. The remaining 412,000 dth per day would move via backhaul to Compressor Station 219 where it would be transported via a forward haul on the 300-Line and HC-Line to the Greenwood interconnect using a combination of new and turnback capacity. An additional 88,000 dth per day of available capacity on the HC-Line would be used to complete the 700,000 dth per day required for the Millennium Project.

Although this Tennessee proposal would cost less than the western portion of Millennium, we cannot recommend it as a feasible alternative because it relies on speculative turnback capacity. Further, Tennessee states in its July 9, 1999 filing that about 212,000 dth per day of turnback capacity was included in its 700,000 dth per day alternative. Also, we note that Tennessee relied on a backhaul of 412,000 dth per day to design the alternative.

A non-turnback alternative was not developed for the following reasons. First, Tennessee stated in its comments that a non-turnback alternative would be less environmentally friendly than its turnback alternative. Second, we believe the facilities necessary to (a) replace the 212,000 dth per day of turnback capacity with new capacity, and (b) eliminate the use of a backhaul, would require extensive new facilities which would make this alternative uneconomical. Third, similar Tennessee alternatives were previously examined for the DEIS.



#### 3.2.4.4 National Fuel's U.S. Niagara Spur System Alternative

In its comments on the DEIS, National Fuel states that, rather than partially loop the Niagara Spur Loop Line with 42-inch-diameter pipe, a complete loop of the Niagara Spur Loop Line with 36-inch-diameter pipe would be a better design. The loop would continue along National Fuel's X Line to the interconnection with the proposed Millennium pipeline near MP 117.0 in Cattaraugus County. National states that it would install 12,000 hp at the Lockport Station (versus 11,000 hp in the DEIS) and 8,000 hp at the Concord Station (versus 18,000 hp in the DEIS). National Fuel states that with the cooperation of its partners in the Niagara Spur Loop Line, it would be willing to construct this alternative assuming appropriate contractual commitments were received from the proposed shippers. However, it states that this alternative probably could not be constructed to provide service in the same time frame as Millennium.

FERC engineering staff evaluated National Fuel's comments on the Niagara Spur System Alternative and National Fuel's proposed facilities. National Fuel proposes to construct the following facilities:

12.04 miles of new pipeline (\$179,950,000):

- 0.58 mile of 36-inch-diameter pipeline for the crossing of the Niagara River from the interconnection with TransCanada at the U.S./Canadian international border to National Fuel's proposed Niagara Metering and Regulator Station in Niagara County, New York;
- 15.74 miles of 36-inch-diameter pipeline between the Niagara Metering and Regulator Station and the Lockport Compressor Station in Niagara County, New York;
- 56.92 miles of 36-inch-diameter pipeline between the Lockport and Concord Compressor Stations in Niagara and Erie Counties, New York; and
- 38.80 miles of 36-inch-diameter pipeline between the Concord Compressor Station and the MP 117.0 Metering and Regulator Station at the interconnection of National Fuel and Millennium in Erie, Cattaraugus, and Allegany Counties, New York.

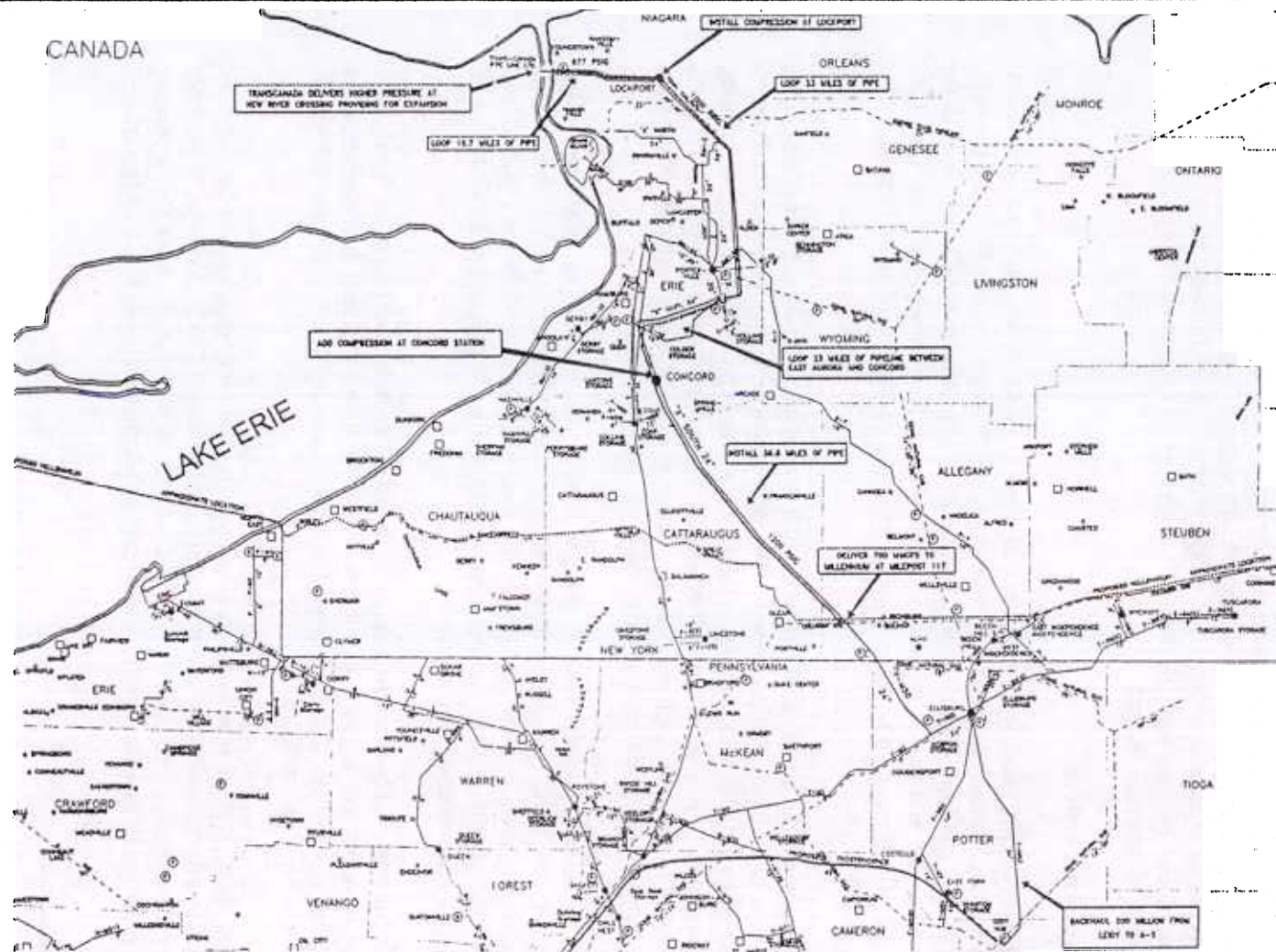
20,000 hp of compression (\$28,800,000):

- 12,000 hp of additional compression at the Lockport Compressor Station in Niagara County, New York; and
- 8,000 hp of additional compression at the Concord Compressor Station in Erie County, New York.

Two metering and regulator stations (\$3,300,000):

- Niagara Metering and Regulator Station in Erie County, New York; and
- MP 117.0 Metering and Regulator Station in Allegany County, New York.

National Fuel estimates that the above-listed facilities would cost about \$212,050,000, which exceeds the estimated \$187,392,971 cost of the 117-mile-long western segment of the Millennium pipeline. Figure 3.2.4.4-1 shows a map with the location of the required facilities.



**FIGURE 3.2.4.4-1**

**MILLENNIUM PIPELINE PROJECT  
NATIONAL FUEL'S  
NIAGARA SPUR SYSTEM  
ALTERNATIVE**

**NOT TO SCALE**

While National Fuel's Niagara Import Point alternative could replace the western segment of the Millennium Project, it would exceed the estimated cost of this segment of the Millennium Project and would have more impact on landowners and land-based resources because the alternative would cross more land than the proposed Millennium Project: about 112 miles compared to Millennium's 84.1 miles. Further, as mentioned previously and based on comments filed by TransCanada, additional pipeline facilities would be required in Canada for any of the Niagara Spur System Alternatives. This would slightly increase pipeline construction and associated costs and require construction on new right-of-way through sensitive national parks in Canada to avoid congested areas near the U.S./Canadian border. Based on these factors we cannot recommend this National Fuel's Niagara Spur System Alternative as an economical or environmentally preferable alternative to the Millennium Project.

### **3.2.5 One-Pipe System Alternatives**

When the DEIS was issued, there were three related projects under review by the Commission. These are the Supply Link, Independence Pipeline, and Market Link Expansion Projects.<sup>13/</sup> These projects, if constructed, would transport gas from the developing natural gas market hub in the Chicago area to the Leidy, Pennsylvania, market hub and then to markets in Pennsylvania, New Jersey, the New York City metropolitan area, and the Atlantic seaboard. These projects would extend across northern Illinois, Ohio, Pennsylvania, and New Jersey.

The first of these projects, the Supply Link Project, will transport gas from the upper midwest in the vicinity of Chicago, Illinois, to Defiance, Ohio, where it will interconnect with the Independence Project. The Supply Link Project will expand ANR's existing system by constructing pipeline looping and adding compression. The Independence Project, owned by Independence, will transport natural gas from Defiance, Ohio, to the Leidy Storage Field in Leidy, Clinton County, Pennsylvania. It consists mostly of pipeline construction along new right-of-way. Neither of these projects has been constructed.

The third project, Transco's Market Link Project, will move the natural gas east from Leidy, Pennsylvania, to markets in New York, New Jersey, Pennsylvania, and the Atlantic seaboard. Parts of the project will be constructed in phases in 2001 and 2002. The Supply Link, Independence Pipeline, and Market Link Expansion Projects will consist of a total of about 625.3 miles of pipeline and 137,400 hp of compression at 3 new and 4 existing compressor stations.

Although the Commission authorized the Supply Link and Independence Projects in April 2000, ANR and Independence have not yet begun construction. To date, both ANR and Independence are completing their environmental surveys and are in the process of receiving the appropriate permits in compliance with the Commission's Certificate.

On December 13, 2000, Transco received Commission authorization to construct its Market Link project in three phases to serve its customers by November 2001 and November 2002. However, in an Order dated April 26, 2001, the Commission noted that Transco did not comply with the provision that it execute contracts fully subscribing Phase III facilities, and did not approve the construction of Phase III facilities.<sup>14/</sup>

---

ANR Pipeline Company's Supply Link Project (Docket Number CP97-319-000), Independence Pipeline Company's Independence Pipeline Project (Docket Number CP97-315-000), and Transco's Market Link Expansion Project (Docket Number CP98-540-000). A certificate was issued for the Independence, Supply Link and Market Link Projects on April 26, 2000.

<sup>14/</sup> Transco has filed for a new Certificate to build certain segments of the previously approved loops and other facilities as Phase III of MarketLink in Docket CP01-389-000 (Leidy East Project). This proposal is still pending.

Transco is currently constructing certain loop segments approved in Phases I and II in Pennsylvania and New Jersey, including the Woodbridge, Haneyville, and Clinton Loops.

In addition, construction of the Vector Pipeline Project, which consists of about 330 miles of 36- and 42-inch diameter pipeline extending from Joliet, Illinois, to St. Clair County, Michigan, was completed in 2000 by Vector Pipeline L.P. (Vector).<sup>15/</sup> The project included construction of two new compressor stations and lease of a 59-mile-long pipeline segment from Michigan Consolidated Gas Company. The system is capable of transporting up to 1 billion cubic feet (Bcf) of natural gas to Dawn, Ontario, although Vector expects to deliver some gas to markets in Michigan. Vector Pipeline Limited Partnership (Vector Canada) constructed an additional 15 miles of pipeline from the Canada/U.S. border to the existing pipeline/gas storage hub at Dawn, Ontario. According to Vector, its project gives natural gas shippers increased access to the Dawn hub and markets in Canada and the eastern U.S., furthering the open flow of natural gas throughout North America.

Finally, TriState Pipeline L.L.C. (TriState) proposed to construct the TriState Pipeline Project,<sup>16/</sup> which would consist of about 228.1 miles of 24-, 30-, and 36-inch-diameter pipeline (150.2 miles of new pipeline and 77.9 miles of pipeline loop) in five segments extending from Joliet, Illinois, to the Canada/U.S. border near St. Clair, Michigan. However, Tri-State withdrew its application on January 18, 2000. Therefore, it has been removed from the alternatives analysis in this FEIS.

ANR/Independence and Vector contend that their projects are a hub-to-hub transportation project, and do not depend on any of the other projects currently planned and proposed.

We evaluated several possible system alternatives that would use portions or all of the proposed ANR/Independence Project, the Vector Project, and the Millennium Project in combination with existing systems to transport all of the gas volumes proposed in these projects. We evaluated the facilities that would be required on the ANR/Independence Project to also transport the proposed Millennium gas volumes, and we evaluated expanding the Vector and Millennium Projects to transport the proposed ANR/Independence volumes. Figure 3.2.5-1 shows the location of each of these projects. System alternatives using these projects are discussed in the following section.

Several key assumptions were used in the development of these system alternatives:

- each evaluated system would have to be capable of transporting both its proposed volumes and the additional volumes that would have been transported by either Millennium or ANR/Independence;
- the ANR/Independence and Millennium Projects could be redesigned because they do not yet exist;
- the Vector Project cannot be redesigned because it has been constructed;
- Transco's Market Link Project would still be needed to be constructed as planned in 2001 and 2002 to meet the need for gas in New Jersey and near Philadelphia; and
- additional facilities would be required in Canada across Ontario and Lake Erie to connect the Dawn hub and the western end of the Millennium system.

<sup>15/</sup> See FERC/EIS-0118D (September 1998) and FERC/EIS-0118F (April 1999) for the Vector Pipeline Project as proposed by Vector Pipeline L.P. in Docket Numbers CP98-131-000 and CP98-133-000. A certificate was issued for the Vector Pipeline Project on May 27, 1999.

<sup>16/</sup> TriState Pipeline Company's TriState Pipeline Project (Docket Nos. CP99-61-000, CP99-62-000, CP99-63-000, and CP99-64-000).

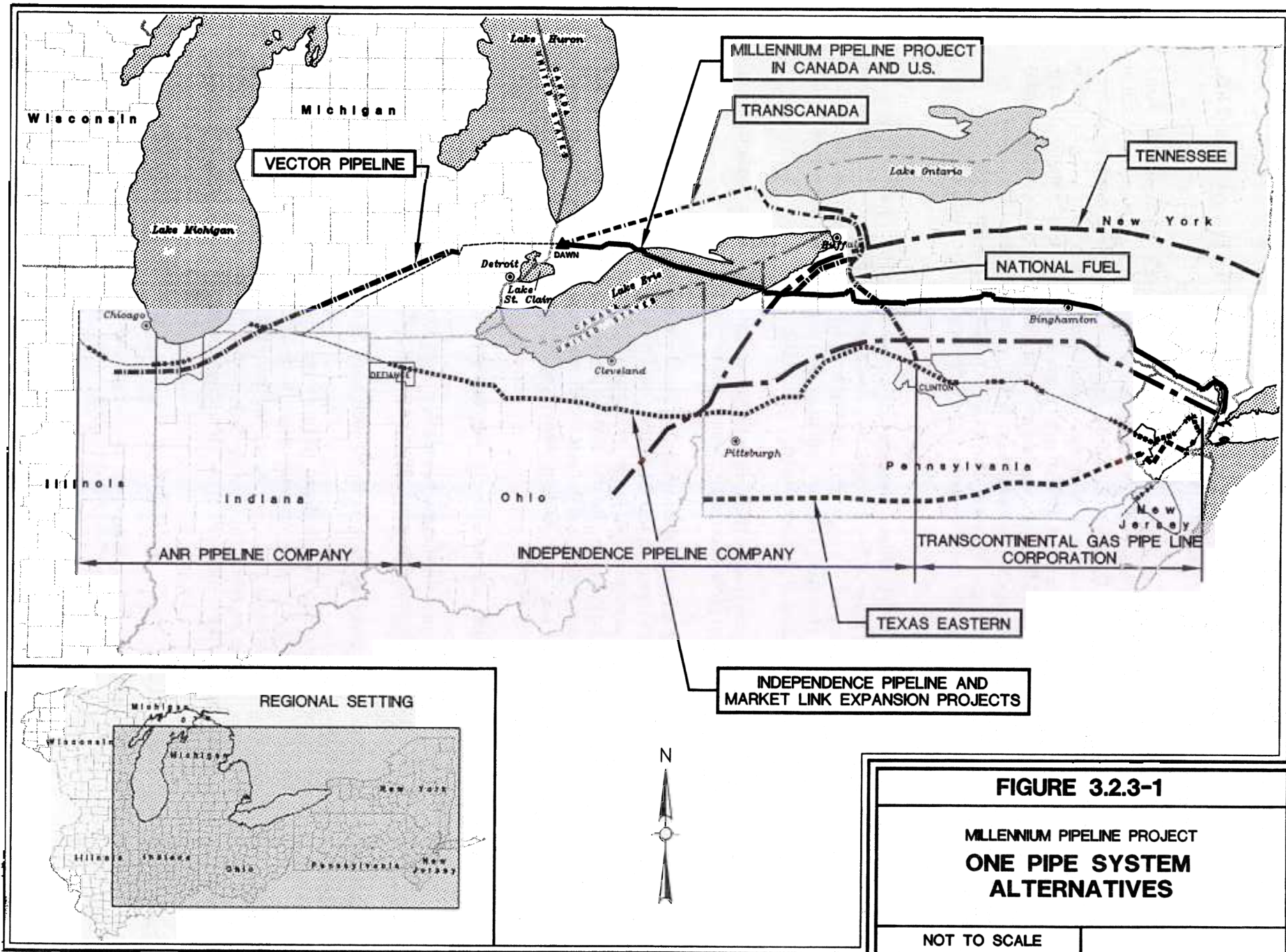


FIGURE 3.2.3-1

MILLENNIUM PIPELINE PROJECT  
**ONE PIPE SYSTEM  
 ALTERNATIVES**

NOT TO SCALE

For our system alternatives analysis, we assumed that the Vector Project could be interconnected through Canadian facilities and the Dawn, Ontario, market hub with the proposed Millennium Project as a system alternative to the ANR Supply Link and Independence Projects. Additional facilities likely would be needed in Canada to accommodate the additional gas volumes that would be transported.

### 3.2.5.1 Vector-Millennium System Alternative

The Vector-Millennium System Alternative would require construction of substantial new facilities to increase the capacity of each project to accommodate the ANR/Independence volumes. For Independence's volumes of about 1 Bcf per day to be delivered into the Leidy hub through the Millennium system (and still allow Millennium's customers to be served), we estimate that Millennium would need to:

- construct one 40,000-hp compressor station on the U.S. side of Lake Erie;
- increase its pipe diameter size from 36 inches to 42 inches for about 144 miles from the Canada/U.S. border in Lake Erie to the interconnect with National Fuel/CNG in New York (see below);
- construct about 50 miles of new 42-inch-diameter pipeline from the National Fuel/CNG interconnect to the Leidy hub in north central Pennsylvania;
- construct one 12,000 hp compressor station at the National Fuel/CNG interconnect in Allegany County, New York; and
- construct one 10,000 hp compressor station somewhere along the new 50-mile-long interconnect pipeline route.

Vector's project, as certificated, will transport up to 1 Bcf of gas to Dawn, Ontario. For the combined Vector-Millennium system carrying 2 Bcf, we identified two scenarios for adding the necessary facilities to Vector's system: the first, maximizing the use of looping adjacent to existing right-of-way; and the second, maximizing the use of compression in lieu of pipeline.

Vector System 1: System 1 would require Vector's facilities, the additional construction of about 313 miles of 42-inch diameter loop and an additional 58,000-hp at two compressor stations. Essentially, Vector would have to loop its entire system.

Vector System 2: System 2 would require Vector's facilities, as well as about 60 miles of 42-inch-diameter loop pipeline and an additional 350,000 hp. To be able to handle the additional compression, Vector would need to redistribute compression on its system between six new compressor stations.

Table 3.2.5-1 summarizes the facilities required and compares the facilities required for the Vector-Millennium System Alternatives to those proposed by ANR, Independence, Vector, and Millennium. The Vector-Millennium System 1 facilities needed for this alternative would result in the construction of a total of about 363 additional miles of pipeline along the Vector and Millennium routes, the construction of three new compressor stations on the Millennium system, and the construction of the proposed facilities for these projects. The total facilities needed for the Vector-Millennium System 1 Alternative would be about 1,110 miles of pipeline and 180,000 hp of compression. For comparison, the facilities that were constructed by Vector and could be constructed by Millennium, ANR, and Independence Projects would total about 1,222 miles of pipeline and 135,000 hp of compression.

TABLE 3.2.5.1-1 Comparison of the Vector-Millennium System Alternatives with the ANR and Independence Proposed Facilities					
System Components	Total Amount of Pipe (miles)		Total Additional Compression ( hp) at New or Existing Compressor Stations (CS)		Comments
Vector System 1 and Millennium	Vector	330	Vector	60,000 at 2 CS	Millennium would also need to increase size of pipe diameter from 36" to 42" for 144 miles.
	Vector System 1:	313 (loop)	Vector System 1:	58,000 at 2 above CS	
	Millennium (as proposed):	417 (new)	Millennium (as proposed):	None	
	Additional upgrade:	50 (new)	Additional upgrade:	62,000 at 3 new CS	
	<b>TOTAL:</b>	<b>1,110</b>	<b>TOTAL:</b>	<b>180,000</b>	
Vector System 2 and Millennium	Vector	330	Vector	60,000 at 2 CS	** Vector would have to relocate one of its 2 proposed CS and redistribute volume over 6 new CS  Millennium would also need to increase size of pipe diameter from 36" to 42" for 144 miles.
	Vector System 2:	60 (loop)	Vector System 2:	350,000 at 6 new CS and 2 existing CS**	
	Millennium (as proposed):	417 (new)	Millennium (as proposed):	None	
	Additional upgrade:	50 (new)	Additional upgrade:	62,000 at 3 new CS	
	<b>TOTAL:</b>	<b>857</b>	<b>TOTAL:</b>	<b>472,000</b>	
ANR and Independence	ANR (as proposed):	74 (loop)	ANR (as proposed):	15,000 at 1 existing CS	
	Independence (as proposed):	401 (new)	Independence (as proposed):	60,000 at 3 new CS	
	<b>TOTAL:</b>	<b>475</b>	<b>TOTAL:</b>	<b>75,000</b>	

The Vector-Millennium System 2 would result in the construction of about 110 more miles of pipeline than that proposed by Millennium and recently constructed by Vector, and the construction of nine new compressor stations (six on Vector's system, three on Millennium's) in addition to the three recently constructed by Vector. A total of about 857 miles of pipeline would be required for the Vector-Millennium System 2 Alternative, which includes the Vector facilities and those proposed by Millennium. About 412,000 hp of compression would be required in addition to the proposed 60,000 hp of compression for the Vector Project. As stated above, for comparison, the proposed Millennium, Vector, ANR, and Independence Projects would require about 1,222 miles of pipeline and 135,000 hp of compression.

The Vector-Millennium Alternatives would require a complete expansion of the Vector system with multiple compressor stations, unknown expansion of Canadian facilities, upsizing about 144 miles of the Millennium Project, adding three compressor stations to the Millennium Project, and adding a 50-mile-long pipeline lateral from Millennium to the Leidy storage hub. In addition to the significant impact on the areas affected by these expansions, staff notes that no one has proposed or is likely to propose this project.

Therefore, for the reasons stated above, we eliminated these two variations of the Vector-Millennium System Alternative from further consideration and conducted no further analysis of them.

### 3.2.5.2 ANR/Independence/Texas Eastern System Alternative

We evaluated a system alternative that would use the ANR and Independence pipeline systems to transport Millennium's gas volumes from the Chicago hub to the Leidy storage hub. From that point the analysis evaluated the use of Texas Eastern's facilities to transport gas from the Leidy hub eastward.

#### Modifications to the ANR System

As approved, the ANR Project involves expanding ANR's Michigan Leg South Mainline and Tieline Mainline from Joliet, Illinois, to an interconnection with Independence in Defiance, Ohio. The additional facilities that would be required on ANR's system to enable it to also transport Millennium's 700,000 dth per day may include 132.5 miles of pipeline, increasing the pipeline diameter of 30.1 miles of proposed pipeline from 30 to 42 inches, and 59,250 hp of additional compression.

#### Modifications to the Independence System

The Independence Project, as approved, would transport about 1 Bcf/d from the interconnection with ANR in Defiance, Ohio, to an interconnection with Transco at the Leidy hub near Leidy, Pennsylvania. The additional facilities on the Independence Project that may be required to transport the Millennium volumes include upgrading the size of the 400.1 miles of 36-inch-diameter pipeline to 42-inch-diameter pipe. Also, about 47,400 hp of additional compression would be needed at three of the compressor stations for the Independence Project and one additional new compressor station for the alternative.

#### Modifications to the Texas Eastern System

Texas Eastern has not filed an application to transport any of the volumes proposed by Millennium or Independence. However, we evaluated use of its system to transport the Millennium volumes from an interconnection with the Independence Project at Leidy, Pennsylvania, to New York City. The alternative would have Texas Eastern deliver gas to: Columbia in Bucks County, Pennsylvania (98,000 dth per day); Algonquin in Hanover, New Jersey (245,000 dth per day); and local distribution companies in New York City (350,000 dth per day). This alternative would not be able to provide the 8,000 dth per day of proposed service to North East. The facilities that would be required on Texas Eastern's system include about 185 miles of 36-inch-diameter pipeline looping and 12,000 hp of compression.

#### Conclusion

Use of this alternative would require that Columbia's Line A-5 remain in service and that the proposed 8,000 dth per day of service to North East would not be provided. The alternative would require increases in compression at eight compressor stations and the construction of a new compressor station. This would add about 118,650 hp of compression to the 75,000 hp of compression approved for the ANR and Independence Projects. No new compression is proposed for the Millennium Project.

The alternative may require about 317.5 miles of pipeline construction on the ANR, Independence, and Texas Eastern systems in addition to the certificated construction of 475 miles of pipeline for the ANR and Independence Projects for a total of 792.5 miles of pipeline. The ANR, Independence, and Millennium Projects would require about 892 miles of pipeline construction. However, replacement of the old Line A-5 is one of the objectives of the Millennium Project; and, therefore, it is anticipated that Columbia would continue to replace portions of its aging, 222-mile-long Line A-5 as it has been doing in recent years. Use of this alternative may only postpone the impact of construction of a later Line A-5 replacement and would then result in not only the impact of constructing the alternative, but the impact of constructing the Line A-5 replacement. This alternative would require the addition of over twice as much new compression and could

result in additional workspace requirements for spoil storage along the segments of pipeline that would be upsized to 42 inches. A wider and deeper trench would be required. Additional workspace would be needed to accommodate the increased trench width and spoil storage space requirements. Finally, it would not meet all of the proposed project's objectives; therefore, we did not evaluate this alternative further.

### **3.2.5.3 Leidy Interconnection System Alternative**

This alternative would replace about 144 miles of the western portion of the Millennium Project and would avoid a Lake Erie crossing. It would use the alternative ANR and Independence pipeline and compressor facilities as previously described, but would require the construction of a 50-mile-long pipeline from the Leidy hub to interconnect with the proposed Millennium pipeline in New York and a new 8,000 hp compressor station. In addition to the ANR and Independence Projects facilities, this alternative would require the construction of about 182.5 additional miles of pipeline and about 114,650 hp of additional compression. It would also require construction of about 273 miles of the proposed Millennium Project. The Leidy Interconnection System Alternative would require a total of about 980.5 miles of pipeline and 197,650 hp of compression. This alternative would have a greater environmental impact than the projects because it would be about 88.5 miles longer and would require more compression; therefore, we did not evaluate it further.

### **3.2.5.4 ANR/Independence/National Fuel Leidy System Alternative**

ANR filed comments based on a suggested system alternative that would use the facilities it and Independence will construct plus additional facilities on those systems and on National Fuel's system. ANR/Independence/National Fuel did not comment on an alternative that included their facilities as well as Texas Eastern's facilities. ANR/Independence/National Fuel believe that a Leidy System Alternative is feasible and that it can be constructed for less money and less environmental impact than the alternative presented in the DEIS. ANR estimates the cost of constructing facilities on its system would be about \$395,000,000 which is about \$270,000,000 above the as-filed cost for construction of ANR's facilities in CP97-319 of \$125,000,000. ANR states that it is willing to expand its system to accommodate the future needs of both the Millennium and Market Link Projects.

Independence states that it could deliver both the Millennium and Market Link Project volumes with the construction of an additional 90,000 hp at 6 compressor stations and that this compression could be added as it is required without requiring any change to Independence's as-filed design or plans for construction as proposed in CP97-315. Independence is willing to undertake this expansion to accommodate the future needs of both the Millennium and Market Link Projects as future needs develop.

National Fuel states that an alternative could be developed that would not require construction of 50 miles of 36-inch-diameter pipeline between Leidy and the Millennium system, and would not require additional compression. National Fuel could transport the Millennium volumes from Leidy by displacement and/or backhaul from Leidy to Ellisburg with the construction of only 19 miles of 36-inch-diameter pipeline from Ellisburg to proposed Millennium MP 148.0. All of this construction would be on existing National Fuel right-of-way, plus some header rearrangement at Ellisburg. The estimated cost of these facilities would be about \$30,500,000.

## Staff Evaluation

In their concurrent comments on the Millennium Project DEIS, ANR, Independence, and National Fuel presented alternatives that, when taken collectively, would replace the western portion of the proposed Millennium Project.<sup>17/</sup> This alternative would consist of three legs:

ANR would transport, 700,000 dth per day to the Defiance interconnect with Independence in Defiance County, Ohio, using new capacity on its Michigan Leg South and Tieline Systems, and existing capacity on its Southeast Mainline System;  
From Defiance, Independence would transport the 700,000 dth per day to interconnects with National Fuel at the Wharton Storage Field and Leidy Hub in Potter and Clinton Counties, Pennsylvania, respectively, using unsubscribed and new capacity; and  
National Fuel would transport the 700,000 dth per day received from Independence to an interconnect with Millennium at Millennium's MP 148.0 in Allegany County, New York, via a combination of displacement, flow reversal, and new capacity.

ANR, Independence, and National Fuel would construct the following facilities to replace the western portion of Millennium:

ANR<sup>18/</sup> - 164 miles of pipeline loop: \$232,000,000

6.2 miles of 42-inch-diameter pipeline loop on the Michigan Leg South System in Kendall County, Illinois;  
25.6 miles of 42-inch-diameter pipeline loop on the Michigan Leg South System in Will County, Illinois;  
41.6 miles of 42-inch-diameter pipeline loop on the Michigan Leg South System in Porter and La Porte Counties, Indiana and Berrien County, Michigan;  
43.2 miles of 36-inch-diameter pipeline loop on the Tieline System in Berrien and Cass Counties, Michigan and Elkhart and Lagrange Counties, Indiana;  
47.5 miles of 36-inch-diameter pipeline loop on the Tieline System in Lagrange, Steuben, and DeKalb Counties, Indiana and Williams and Defiance Counties, Ohio;

ANR - 24,000 hp of additional compression: \$33,000,000

10,000 hp additional compression at the Bridgeman Compressor Station in Berrien County, Michigan;  
7,000 hp additional compression at the Lagrange Compressor Station in Lagrange County, Indiana; and  
7,000 hp additional compression at the Defiance Compressor Station in Defiance County, Ohio.

Independence 103,200 hp of additional compression: \$94,400,000

19,400 hp additional compression at the proposed East Defiance Compressor Station in Defiance County, Ohio;

---

The western portion of Millennium consists of the portion of the proposed project between MPs 0 and 148.

<sup>18/</sup> ANR designed its facilities on the basis that the 3.0 mile, 42-inch-diameter pipeline loop on its Michigan Leg South System proposed in Docket No. CP99-241-000 would be in service.

24,700 hp of new compression at a new compressor station at MP 67.5 (Compressor Station 2) in Seneca County, Ohio;  
 9,700 hp of additional compression at the proposed Canaan Compressor Station in Wayne County, Ohio;  
 24,700 hp of new compression at a new compressor station at MP 211.8 (Compressor Station 4) in Columbiana County, Ohio;  
 9,700 hp of additional compression at the proposed Porter Compressor Station in Clarion County, Pennsylvania; and  
 15,000 hp of new compression at a new compressor station at MP 340.1 (Compressor Station 6) in Elk County, Pennsylvania.

National Fuel - 19. miles of pipeline loop: \$28,000,000

19.1 miles of 36-inch-diameter pipeline loop of Line YM55 from the Ellisburg Station (in Potter County, Pennsylvania) to Millennium MP 148.0 (in Allegany County, New York);

National Fuel - Additional facilities: \$2,500,000

miscellaneous headers rearrangement/compressor modifications at the Ellisburg Station in Potter County, Pennsylvania; and  
 a new meter station (MP 148.0) between National Fuel and Millennium in Allegany County, New York.

The ANR/Independence/National Fuel Leidy System Alternative would require a total of 183.2 miles of pipeline loop and 127,200 hp of compression. The pipeline companies' cost estimates for these facilities would be:

ANR	\$	265,000,000
Independence		94,400,000
National Fuel		<u>30,500,000</u>
Total	\$	389,900,000

The total estimated cost for these facilities exceeds the cost of the first 148 miles of Millennium Project (\$237,000,000) by \$152,900,000.<sup>19/</sup>

For this alternative ANR would receive 600,000 dth per day from an interconnect with Alliance Pipeline, L.P., (Alliance) in Will County, Illinois. This volume would be transported via new capacity on ANR's Michigan Leg South and Tieline Systems to interconnects with ANR's Southeast Mainline System and Independence in Defiance County, Ohio. An additional 100,000 dth per day would be delivered to the Defiance Interconnect via available capacity on ANR's Southeast Mainline. Independence would then transport the volumes to interconnects with National Fuel at the Wharton Storage Field and Leidy Hub using unsubscribed capacity (287,000 dth per day in the summer and 306,000 dth per day in the winter) and new capacity (484,000 dth per day in the summer and 440,000 dth per day in the winter).

National Fuel would use a combination of pipeline loop, displacement, and physical reversal of flow of its existing design system flows to effectuate the delivery of 700,000 dth per day to the proposed interconnect with Millennium in Allegany County, New York. The physical reversal of flow would be

<sup>19/</sup>

The Millennium cost estimate comes from Exhibit K of Millennium's application (\$602,860,806 for 376.4 miles of 36-inch diameter pipe).

accomplished by the use of spare seasonal transmission compression in the summer, and the redirection of transmission horsepower in the winter. National Fuel states that this redirection of flow would obviate the need for additional facilities between the Leidy Hub or the Wharton Storage Field and the Ellisburg Station in Potter County, Pennsylvania; however, National Fuel would require the looping of its Line YM55 between the Ellisburg Station and the Millennium interconnect as discussed above.

Although the ANR/Independence/National Fuel Alternative appears to be feasible, we cannot recommend it as a viable alternative because Independence based its portion of the alternative on unsubscribed capacity on its system. A true alternative to Millennium would require 1,700,000 dth per day of capacity on Independence (Independence's proposed capacity of 1,000,000 dth per day and Millennium's proposed capacity of 700,000 dth per day).

We developed a variation to the ANR/Independence/National Fuel alternative that did not utilize unsubscribed capacity on Independence (i.e., would provide an additional 700,000 dth per day of capacity on Independence over and above the certificated capacity). This variation would require the following Independence facilities in addition to those proposed in the ANR/Independence/National Fuel Leidy System Alternative:

73,700 hp at pending and new compressor stations: \$56,500,000

- 5,500 hp of additional compression at the proposed East Defiance Compressor Station in Defiance County, Ohio;
- 10,000 hp of additional compression at the new Compressor Station 2 in Seneca County, Ohio;
- 12,000 hp of additional compression at the proposed Canaan Compressor Station in Wayne County, Ohio;
- 16,600 hp of additional compression at the new Compressor Station 4 in Columbiana County, Ohio;
- 19,000 hp of additional compression at the Porter Compressor Station in Clarion County, Pennsylvania; and
- 10,600 hp of additional compression at the new Compressor Station 6 in Elk County, Pennsylvania.

Based on the costs provided by Independence, we estimate that the cost of these facilities would be approximately \$56,500,000 bringing the total cost of the alternative to \$446,400,000, which exceeds the estimated cost of the western portion of Millennium by \$209,400,000. Because of the extreme cost differential, we cannot recommend this as an economical alternative.

### **3.2.6 Planned Future Projects**

Several comments were received about projects that are either in the planning stages or have been filed with the FERC for construction authorization. These projects and their viability as system alternatives to the Millennium Project are discussed in the following section.

#### **3.2.6.1 CNG Planned or Proposed Projects**

##### **Crossroads Project**

Crossroads Pipeline Company (Crossroads), a subsidiary of NIPSCO Industries, Inc., in partnership with CNG, and the East Ohio Gas Company (East Ohio Gas), an affiliate of CNG, are planning a joint project (Crossroads Project) to deliver natural gas from U.S. and Canadian supply basins through the Chicago area

and into expanding eastern markets. An application for section 7(c) NGA authority for the Crossroads Project has not yet been filed with the Commission. According to the project sponsors, this project would maximize the use of existing facilities and require little additional construction to transport natural gas to interconnections with natural gas pipeline systems currently serving the New York City metropolitan area.

In its comments on the DEIS, CNG states that it continues to pursue the Crossroads Project, but it has been unable to find shippers willing to sign binding contracts for the capacity. It concludes, therefore, that there is no need for the Crossroads capacity, or any other pipeline capacity, in the near term and that is the reason it has not yet filed an application for Crossroads with the Commission. It also states that while Crossroads would not be capable of transporting both the Crossroads and Millennium volumes, it would be a viable and reasonable alternative to transporting only the Millennium volumes. However, CNG again states that there is no need for additional pipeline capacity. As stated in our response to similar comments, the issue of need for the Millennium Project will be decided by the Commission and will be discussed in the order that will be issued for Millennium's application.

As with the previous pipeline system alternatives, the Crossroads/CNG system alternative would not be able to deliver natural gas to the delivery points currently served by Columbia's Line A-5 nor could it serve the receipt and delivery points proposed to be served by the Millennium Project (see figure 1.1-1). In addition, since the Crossroads project has not been filed with the Commission, we do not know the exact location of the facilities or the proposed in-service dates. We also cannot determine what additional facilities might be required or if this project could be a practical alternative to the Millennium Project. For these reasons, we did no further analysis of this system alternative.

#### **Other Projects**

CNG states that alternative uses of its existing system plus incremental expansion of its existing pipeline system, as needed, could serve demand growth in the northeast. However, CNG states that while it has examined a "host of options, and continues to do so," it has not filed an application for any project. CNG states that its existing system can serve to eliminate the need for the western portion of the Millennium Project since it could interconnect with the proposed project near Horseheads, New York.

CNG states that one part of the options it is evaluating includes the role storage may play in providing service. Gas may be delivered to storage fields on non-peak days and withdrawn when needed. Storage can be used to eliminate the need for new, long-line pipelines that CNG states are premised on the need for a year-round infrastructure to meet what would likely be an off-peak, low load-factor market. Again, the issue of need for proposed pipeline facilities would be evaluated by the Commission if it issues an order on the Millennium Pipeline Project.

CNG also states in its comments on the DEIS that it is "investigating a series of alternative ways of increasing the receipt of gas supply into its system." Two of these alternatives are variations on the Crossroads Project that would not require Crossroads Pipeline participation. CNG and East Ohio Gas could interconnect with the ANR/Supply Link Project near Defiance, Ohio (at the origin of the Independence Project) or with the facilities of Panhandle Eastern Pipe Line Company (Panhandle) at Maumee, Ohio. It states that less than 15 miles of pipeline plus an undefined amount of compression would be required for the alternative and that either of these two alternatives could transport up to 150,000 dth per day of natural gas to a Horseheads delivery point into the Millennium pipeline.

A third CNG suggestion involves use of the Tennessee and Midwestern Gas Transmission systems to transport an undefined amount of gas from the Chicago area to Millennium at Horseheads, New York. CNG states that available capacity on these systems could be expanded. However, CNG did not quantify

the amount of capacity that could be developed, identify the facilities that would require modification to increase capacity, or indicate how much gas it could deliver to Horseheads, New York.

A fourth CNG suggestion involves CNG establishing an interconnection with Empire Pipeline (Empire) that would provide increased access to Canadian supplies. CNG states that up to 100,000 dth per day of interruptible transportation capacity on Empire could be made available for receipt into CNG's system at Lysander, New York (just north of Syracuse), but that this proposal would require some facility expansion on Empire which was not identified. CNG states it could then deliver gas on a firm basis to an interconnection with the proposed Millennium facilities or into CNG's storage fields. According to CNG, no new pipeline facilities would be required for this; however, some undefined amount of compression would be required. CNG states that it could receive up to 300,000 dth per day of transportation capability from Empire near Rochester, New York, and could transport the gas to Horseheads.

A fifth CNG suggested alternative involves expanding CNG receipt capability from Iroquois. CNG states that this alternative would allow an additional 200,000 dth per day of interruptible transportation capacity receipts from Iroquois into CNG at Canajoharie, New York. It concludes that it could deliver this gas on a firm basis to Millennium at Horseheads or into storage, and that this would not require any pipeline construction, but would require an undefined amount of additional compression at unidentified locations.

CNG again restates its opinion that the reason it has not filed any applications to construct these facilities is because they are not needed now. It states that "as demand growth develops, incremental projects like these can be brought on line more economically and with much less effect on the environment and landowner rights than a large, greenfield pipeline project like Millennium." It further states that these suggested alternatives are presented in its comments on the DEIS because they highlight a wide range of alternatives not considered in the DEIS.

While FERC staff evaluated more alternatives than those presented in the DEIS, the DEIS only presented system alternatives that minimized the amount of pipeline construction that would be required for a system alternative based on information that was filed at the Commission about the operation of the various pipelines near the proposed Millennium Project. It did not speculate about the possibility that a pipeline might expand capacity somewhere else on its system so it might be able to provide transportation service for Millennium's customers unless it was along the routes identified in the DEIS. While CNG has presented a "wide range" of possibilities, it also states that its suggested alternatives are not feasible because CNG does not believe there is a market demand for its suggested facility expansions.

It would be counter-productive to evaluate every possible routing of gas through existing facilities because this would result in a confusing array of potential alternatives. No pipeline company that filed comments about the system alternatives presented in the DEIS has filed an application to construct its suggested alternative facilities.

### **CNG/Tennessee Atlantic Advantage Project (formerly the Atlantic Alliance Project)**

On July 19, 1999, CNG and Tennessee issued a press release about their new west-to-east transportation option to transport up to 750,000 dth per day of natural gas from the Chicago market areas and the Niagara Import Point to eastern markets. CNG refers to this project in a July 20, 1999 filing. An open season was planned for August 1999. The press release states that up to 100,000 dth per day of service could be provided by winter 1999/2000. Based on customer service requests, construction of facilities to provide service could be phased-in, but the full 750,000 dth per day of service could be available by November 1, 2001. CNG has commented extensively about the lack of need for the 700,000 dth per day of additional pipeline capacity proposed for the Millennium Project in November 2000, but has conducted an open season for 750,000 dth per day of capacity to serve markets in New York, Pennsylvania, and New England by

November 1, 2001. Neither the press release nor CNG's July 20, 1999 comment include any description of the facilities that would be required for the contemplated project. Therefore, we cannot compare the unknown facilities of the Atlantic Advantage Project to the Millennium Project. To date, CNG has not filed an application to construct this project.

### 3.2.6.2 Stagecoach Project

eCORP, L.L.C. (eCORP) states in its comments on the DEIS that one of its pending projects, the Stagecoach Storage Project <sup>20/</sup> located in Tioga County, New York, could have an impact on long haul pipelines being proposed to deliver gas from areas in the U.S. and Canada to the northeast consuming regions. It plans to develop high deliverability gas storage fields in depleted oil and/or gas fields that may perform similarly to salt cavern storage and may, similarly, act to supply peak service. This project is presently under construction.

eCORP states that one of the major purposes of the Stagecoach Storage Project is to support the operation of gas fired generating capacity that is the target of much of the gas infrastructure development activity now ongoing in the northeast. One of its affiliates is pursuing developing a 500 MW combined cycle power plant in Tioga County, New York, near the Stagecoach Storage Project. Some of the capacity in the Stagecoach Storage Project would be used to support the fluctuating gas demand requirements of the power plant. Similarly, it could be used to support the fluctuating demand of power plants in the Northeast.

Another purpose of the project is to permit more efficient use of pipeline capacity that moves gas from the west and Canadian import points in New York to the major consumption areas in the northeast. eCORP states that the Stagecoach Storage Project could have a significant effect on the total number, location, and timing of new long-haul pipeline capacity additions that are being proposed to meet the region's growing gas deliverability requirements and to support the expected growth in gas-fired generating capacity in the Northeast.

eCORP's corporate affiliate, Central New York Oil and Gas Company, LLC (CNYOG), states in its applications filed with the Commission for the Stagecoach Storage Project that it would provide an initial working gas capacity of about 11.94 Bcf at a reservoir pressure of 2,850 psi and about 13.6 Bcf at pressure of 3,250 psi. The gas withdrawal capacity (deliverability) will be up to 500 MMcf/d and the gas injection capacity would be 250 MMcf/d. eCORP states that, depending on market conditions, the field can later be expanded to increase working gas capacity to 20 Bcf and increase deliverability up to 600 to 800 MMcf/d.

The storage field will have a surface area of about 5,172 acres. It will require construction of up to 24 storage injection/withdrawal wells; a pipeline gathering system consisting of about 10 miles of 6-, 12-, and 20-inch-diameter pipelines with 14 meter stations and isolating valves; a 25,000-hp compressor station; a 4.8-mile-long, 12-inch-diameter pipeline (Twin Tier Lateral) between the compressor station and a new non-jurisdictional electric generating facility (Twin Tier Power Plant); about 2 miles of permanent access roads; and a non-jurisdictional 1.6-mile-long 115 kilovolt electric transmission line to the new compressor station.

Tennessee's related pipeline facilities will involve construction of a new 23.7-mile-long, 30-inch-diameter pipeline (the Stagecoach Lateral) from Bradford County, Pennsylvania, to Tioga County, New York, with a bi-directional meter station in Tioga County; a 3.9-mile-long loop of the 300 Line in Susquehanna County, Pennsylvania; a new 14,550-hp compressor station in Pike County, Pennsylvania; and

<sup>20/</sup> On December 30, 1999, Central New York Oil and Gas Company, LLC, eCORP's corporate affiliate, filed an application for the Stagecoach Storage Project (Docket Numbers CP00-61-000, CP00-62-000, and CP00-63-000). Tennessee also filed an application on December 30, 1999, under section t(c) of the NGA to construct related pipeline facilities (Docket Number CP00-65-000). A certificate was issued for this project on February 23, 2001.

a total of about 6.5 miles of 24-inch-diameter replacement pipeline at various locations on the 300 Line in Pennsylvania and New Jersey; and various system upgrades at meter stations and mainline valves. (See figure 3.2.6.2-1 for the location of this project.)

These projects were approved by the Commission and will take about 9 to 12 months to complete construction. Construction is under way.

The Stagecoach Storage Project will be about 8 miles south of Columbia's Line A-5, about 20 miles north of Tennessee's 300 Line, and about 50 miles north of Transco's Leidy Line. eCORP states that its project will also be near CNG's pipeline system. Additional connecting pipelines could be constructed to the proposed Millennium Pipeline and other pipeline systems in the area.

eCORP states that the storage field may reduce or eliminate the need for some of the capacity additions, particularly those west of the Stagecoach Storage Project, or might significantly delay the installation date for such capacity additions. It suggests that, under one alternative, the western portion of the Millennium pipeline would be unnecessary. It could be constructed from the Stagecoach Storage Project (which would require a slight modification of the Millennium Pipeline Project from the proposed route to connect to the field), but that the Millennium Pipeline Project would then be constructed as proposed to its eastern terminus. This would still allow a substantial portion of the old Line A-5 to be replaced. The Stagecoach Storage Project would then serve as a market hub area, and eCORP would construct a pipeline south to interconnect with Tennessee and Transco, act as a header system, and provide access to multiple supply and delivery points; providing greater flexibility for each pipeline. Although some looping of the interconnecting pipelines would be required east of Stagecoach Storage Project to accommodate both peak and long-term delivery capabilities of the Stagecoach Storage Project to meet the needs of downstream customers, eCORP states the environmental impact of these upgrades would be less than construction of the various long haul, high pressure pipelines currently being proposed.

Millennium commented that eCORP's planned Stagecoach Storage Project could potentially benefit Millennium's shippers in terms of reliability of service, diversity of supply, and liquidity. Millennium could similarly benefit eCORP and could provide it with access to electric generation plants and other markets. While Millennium states that it appreciates these potential mutual benefits, the development of the Stagecoach Storage Project would not eliminate the need to construct Millennium's facilities west of that field. All of Millennium's shippers have designated the Lake Erie import point on Millennium's system as their receipt point for service. Millennium's facilities west of the Stagecoach Storage Project are thus essential to provide the requested services.

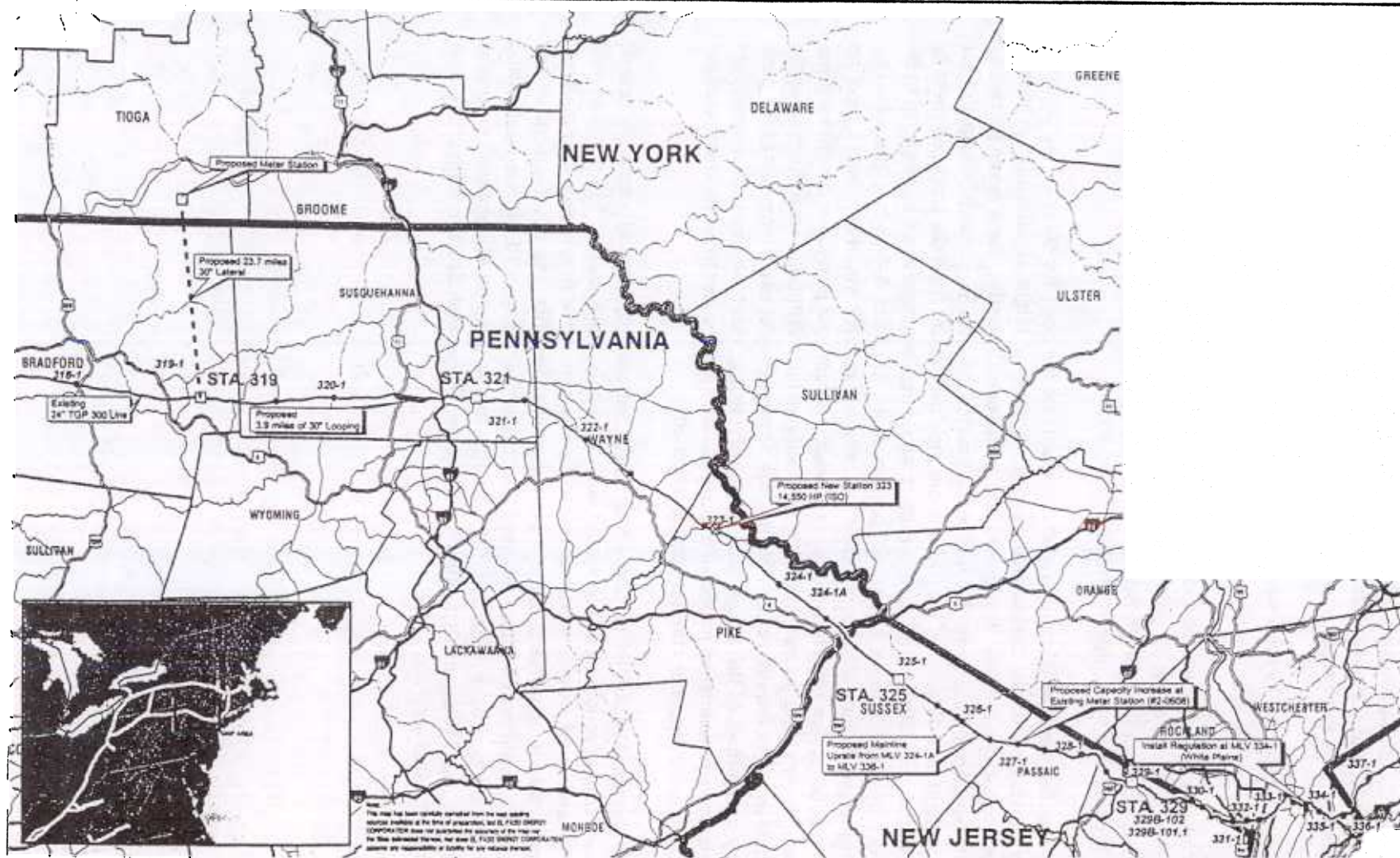


FIGURE 3.2.6.2-1

MILLENNIUM PIPELINE PROJECT  
eCORP AND TENNESSEE  
STAGECOACH STORAGE AND  
EXPANSION PROJECTS

NOT TO SCALE

While eCORP's Stagecoach Storage Project could provide storage service for the Millennium shippers, it cannot provide service to Millennium shippers without construction of some or all of the proposed facilities. Therefore, we did not analyze this system alternative further.

### 3.2.7 Algonquin/Iroquois Pipeline System Alternative

We evaluated the combined use of the existing pipeline systems of Algonquin and Iroquois to transport gas from the Ramapo Station (MP 376.4) to a proposed delivery point with ConEd's facilities in Eastchester, New York, on Iroquois' system, thus avoiding the Hudson River crossing. This system alternative would require the construction of additional facilities on both the Iroquois and Algonquin systems and construction of the proposed Eastchester Expansion Project.<sup>21/</sup>

Algonquin's system would require the following facilities (all of the pipeline looping would be 42-inch-diameter pipe):

- about 6 miles of looping extending upstream from Algonquin's Stony Point Compressor Station in Rockland County, New York;
- about 22.1 miles of looping extending downstream from the Stony Point Compressor Station and across the Hudson River in Rockland, Westchester, and Putnam Counties, New York;
- about 7.8 miles of looping extending downstream from Algonquin's Southeast Compressor Station in Putnam County, New York and Fairfield County, Connecticut;
- 1,000 hp of additional compression at the Stony Point Compressor Station in Rockland County, New York; and
- 1,500 hp of additional compression at the Southeast Compressor Station in Putnam County, New York.

Iroquois was asked to provide an estimate of the facilities that would be required if it were to transport 350,000 dth/day of natural gas from its existing interconnection with Algonquin at Brookfield, Connecticut, to its proposed delivery point with ConEd in Eastchester, New York. Iroquois stated it would need to construct the following facilities:

- 8,818 hp of additional compression at the Athens Compressor Station in Athens, New York;
- cooling facilities at the Dover Compressor Station in Dover, New York;
- a new compressor station in Brookfield, Connecticut (Iroquois MP 308.83) consisting of an 8,818 hp mainline compressor and an 8,818 hp compressor to boost gas pressure received from Algonquin into Iroquois' system (Brookfield Compressor Station); and
- a new 11,980 hp compressor station in Devon, Connecticut (Iroquois MP 336.95) (Devon Compressor Station).

The total cost for these alternative facilities on the Iroquois and Algonquin systems would be about \$199,000,000, plus the cost of the proposed Eastchester Expansion Project (\$173,900,000), compared to the estimated \$76,150,000 for construction of the proposed Millennium facilities between the Ramapo Station and the terminus in Mount Vernon, New York. This cost does not include the cost to construct a lateral to provide service to IBM, a proposed Millennium customer, or to the Bowline Power Plant. These additional costs might make the alternative economically unviable.

<sup>21/</sup> On April 28, 2000, Iroquois filed an application in Docket No. CP00-232-000 to construct the Eastchester Expansion Project. On December 15, 2000, Iroquois amended its application changing a portion of the pipeline route.

The system alternative would require a crossing of the Hudson River at a location that would be difficult to complete, as discussed previously. About 36 miles of 42-inch-diameter pipeline and 40,934 hp of new compression (additions at three existing compressor stations and two new compressor stations) plus the construction of Iroquois' pending Eastchester Expansion Project (32.8 miles of 24-inch-diameter pipeline and the addition of compression at 4 compressor stations, including 2 new stations), a 4.2-mile-long lateral to the Bowline Power Plant (however, these facilities may be built by Hudson Valley Corporation), and a lateral to IBM would be required for this alternative.

These alternative facilities would have greater impact because they would require at least 72.9 miles of pipeline compared to the proposed 45.4 miles of 24-inch-diameter pipeline proposed between Ramapo and Mount Vernon, New York. If a pipeline lateral would be required to serve IBM, there would be additional environmental impacts. Further, the location and amount of facilities that would need to be constructed on the ConEd system downstream of the proposed interconnection between Iroquois' Eastchester Expansion Project and ConEd's in Bronx, New York, are unknown. It can be assumed, however, that nonjurisdictional pipeline facilities would be needed on ConEd's system to transport gas for the combined Iroquois and Millennium shippers. As previously discussed, construction of a new pipeline or a pipeline loop along Algonquin's existing 30- and 26-inch-diameter pipelines in Rockland County would require construction through several residential developments that have encroached on the existing pipelines. This alternative has not been proposed by either Algonquin or Iroquois, and we cannot require a company to construct and operate facilities for another pipeline company. For these reasons, we do not believe that this system alternative is a reasonable alternative to the proposed project.

#### **3.2.8 System Alternatives for the 9/9A Proposal**

##### **Joint Pipeline Projects System Alternative**

During the development of the SDEIS, local government officials in Westchester County suggested that the Commission establish a process for developing joint pipeline projects as an alternative to the Millennium Pipeline Project and the 9/9A Proposal. They also suggested that Millennium's application be processed not as a stand-alone project but in the context of a regional demand analysis. They listed actual or potential pipeline interconnects that could be used for such a joint project, including an interconnect with Algonquin, potential interconnects with Tennessee and Iroquois, and an existing interconnect of the systems of Tennessee and Transco. The Commission encourages projects involving the least environmental disruption, and the DEIS and the SDEIS have explored various system alternatives to achieve the Millennium deliveries. However, the Natural Gas Act and its implementing regulations do not mandate projects by parties who have not agreed to own and operate facilities on a joint basis. Also, no competing application has been filed. Therefore, the Millennium application, which proposes specific facilities, with markets supported by executed precedent agreements, must be processed as a stand-alone proposal.

##### **Eastchester Expansion System Alternative**

The only single pipeline company system alternative that was identified for the 9/9A Proposal would involve using the Eastchester Expansion Project as proposed by Iroquois in Docket No.CP00-232-000, as amended.<sup>22/</sup> Iroquois is planning a pipeline project that would provide between 220,000 to 230,000 dth per day of natural gas to the New York City area. The project would require construction of about 32.8 miles of 24-inch-diameter pipeline that would be operated at 1,440 psig, facilities at three existing and two new compressor stations, and appurtenant pipeline facilities. The Eastchester Expansion Project is currently under FERC review.

---

The DEIS for the Eastchester Expansion Project was issued in August 2001

The proposed pipeline extension would originate in Northport, New York, on Long Island, would cross Long Island Sound in a westerly direction, would come onshore near Locust Point, and would terminate at a new interconnection with the facilities of ConEd in Bronx, New York. About 30.7 miles of the project would be installed on the bottom of Long Island Sound with the remaining construction on shore in Eastchester, New York. Onshore construction would be primarily within or along streets. Further, capacity expansion of the existing mainline would be accomplished by the addition of compression at four locations. The targeted inservice date would be November 1, 2002.

We evaluated whether the Eastchester Expansion Project might serve as an alternative to delivering the proposed Millennium volumes to Mount Vernon, New York. Both the Iroquois and Millennium delivery points could serve the New York City market area providing similar pipeline capacity. Millennium's proposal would provide up to 350,000 dth per day at Mount Vernon. Iroquois' proposal would provide between 220,000 to 230,000 dth per day at the Bronx. The Eastchester Expansion Project would require construction of about 32.8 miles of pipeline, compared with the 31.7 miles of pipeline construction in Westchester County proposed by Millennium (including the 9/9A Proposal) that would extend from the east bank of the Hudson River to the terminus at Mount Vernon. A system alternative would have to provide the proposed transportation volumes of both projects, or between 570,000 and 580,000 dth per day.

Our analysis showed that construction of a system alternative on Iroquois' system would require construction of the proposed Eastchester Expansion Project and additional pipeline looping and compression on other parts of Iroquois' system upstream of Long Island. Since we identified no environmental advantage with this system alternative, we conducted no further analysis of expanding only Iroquois' facilities to serve as a system alternative. We did, however, evaluate a system alternative using the Iroquois and Algonquin systems in section 3.2.7.

### **Use of the Existing Tennessee or Transco Pipeline Systems**

In a February 23, 2001, letter, the Villages of Croton-on-Hudson, Ossining, and Briarcliff Manor, New York, expressed concern that not all possible alternatives have been evaluated by staff. Specifically, they suggest the use of either the Tennessee system or the Transco system as an alternative to either the eastern portion of Millennium's system in New York or its Hudson River crossing. Staff did not use Tennessee's facilities between its interconnects with Algonquin at Mahwah in Bergen County, New Jersey, and ConEd at White Plains in Westchester County, New York, as an alternative because of the distance between compressor stations (160 miles), the length of haul (about 63 miles) and the relatively small pipeline diameter (24 inches) of Tennessee's mainline. In comparison, the portion of the Algonquin system used in staff's alternative is a more direct route with other pipeline facility advantages. Specifically, Algonquin's system offers the following advantages over Tennessee's system: a shorter distance between compressor stations (about 70 miles); a shorter length of haul<sup>23/</sup>; and a dual 26-inch-diameter and 30-inch-diameter mainline. Because of the longer haul and the smaller diameter pipeline on Tennessee's single mainline system, staff's preliminary analysis showed that substantially more facilities, including but not limited to new compressor station(s) and extensive pipeline looping, would have been required on Tennessee's system. Therefore, staff did not find that using the Tennessee system was a viable alternative.

To use the Transco system to effectuate the delivery of Millennium's 350,000 dth per day of gas volumes to ConEd, staff would have to develop a pipeline route through four different interstate pipelines. Millennium's system would have to transport the gas volumes to the proposed interconnect with Algonquin

---

Staff's alternatives would transport Millennium's gas volumes from the proposed interconnect with Algonquin at Ramapo to Algonquin's existing interconnect with either ConEd at Peekskill (47 miles away) or Iroquois at Brookfield, Connecticut (62 miles away).

at Ramapo in Rockland County, New York. Then, Algonquin would transport the gas via backhaul from Ramapo to Tennessee's upstream interconnect with Algonquin at Mahwah, New Jersey. Tennessee would have to transport the gas on its 24-inch-diameter mainline from Mahwah to its interconnect with Transco at Rivervale in Bergen County, New Jersey. Finally, Transco would have to transport the gas volumes, possibly via a combination of forward haul and backhaul, from Rivervale to ConEd. Staff's preliminary analysis shows that Tennessee and Transco would need additional facilities. Tennessee would need additional facilities because of the reasons discussed above, and Transco would need facilities, at a minimum, to transport the gas volumes across the Hudson River. Because of the possible operational problems that might exist by requiring potentially two or more interstate pipelines to design a backhaul and to add facilities to accommodate Millennium's requirement of 350,000 dth per day, staff did not consider this alternative feasible.

### **3.3 MAJOR ROUTE ALTERNATIVES**

Geographic or major route alternatives are identified to determine if these alternatives could avoid or reduce impact on environmentally sensitive resources, such as large population centers, scenic areas, wildlife management areas, etc., that would be crossed by the proposed pipeline. Route alternatives generally do not change the origin and delivery points for natural gas along the proposed pipeline. Although route alternatives may follow routes significantly different from those proposed, they would not make use of another existing or modified pipeline system, as would a system alternative.

In accordance with Commission regulations (18 CFR, section 2.69[1][in]), primary consideration in identifying potential route alternatives is given to the use, enlargement, or extension of existing rights-of-way to avoid sensitive resources. In general, installation of new pipeline along or within existing, cleared rights-of-way (e.g., pipeline, powerline, road, railroad) is environmentally preferable to the clearing of new rights-of-way. The partial use of previously cleared rights-of-way can reduce construction effects by avoiding creation of new right-of-way through previously unaffected areas.

#### **3.3.1 Lake Erie Alternatives**

##### **3.3.1.1 Alternative Routes Avoiding a Lake Erie Crossing**

We evaluated pipeline routes that would avoid crossing Lake Erie, but would not be integrated with existing pipeline systems. They would, however, be routed to maximize use of existing pipeline rights-of-way. (See also section 3.2.4 for discussion of Lake Erie System Alternatives.)

Millennium's initial route selection study focused on the project's take-off and delivery points (i.e., Dawn, Ontario, to New York City), as well as maximizing the use of existing pipeline corridors, including following the existing Columbia rights-of-way for most of the route to New York City. While much of the route across New York State was predetermined by the location of Columbia's Line A-5, several alternatives were evaluated for the portion of the route from Dawn, Ontario, to an intersection with Columbia's Line A-5. Millennium identified two locations where existing pipelines cross the international border: at the St. Clair/Detroit River near Detroit, Michigan, and at the Niagara River north of Buffalo, New York. Therefore, we examined two major route alternatives identified by Millennium that would avoid crossing Lake Erie: the St. Clair/Detroit River Alternative and the Niagara River Alternative. Millennium also evaluated alternative routes across Lake Erie. Our analysis of these alternatives is presented in the following section. See figure 3.3.1-1 for the general location of these alternatives. See section 3.2 for a discussion of system alternatives that would avoid a Lake Erie crossing.

#### **St. Clair /Detroit River Alternative**

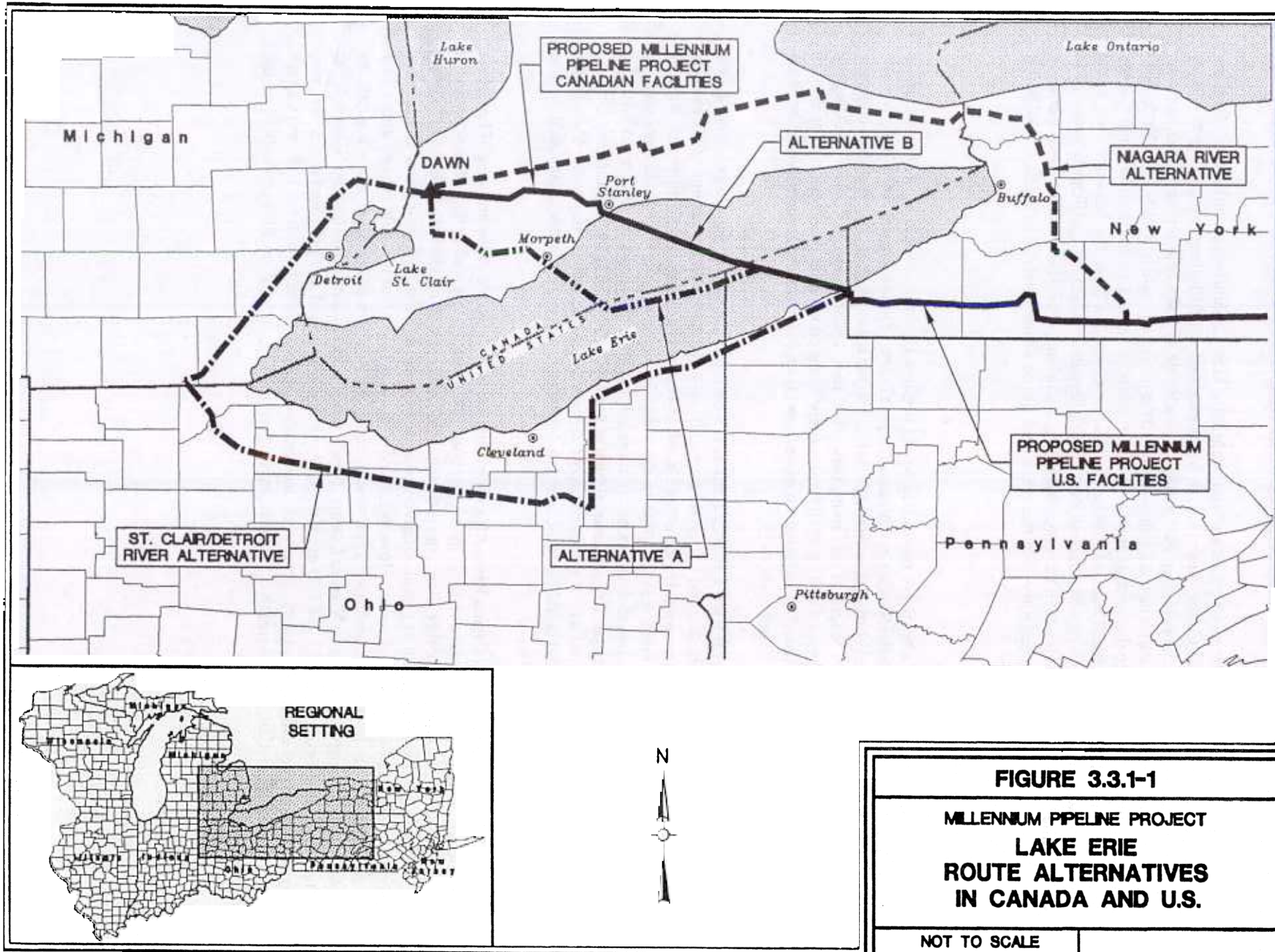
The St. Clair/Detroit River Alternative would begin at the U.S./Canada border, either at the St. Clair or the Detroit River in St. Clair County near Detroit, Michigan, and would follow existing rights-of-way south along the west side of Lake Erie, turn east along the south side of Lake Erie through Ohio, and then north along the east side of Lake Erie through Pennsylvania to the proposed route in Ripley, New York. This alternative would be adjacent to the existing rights-of-way of ANR or Texas Eastern from St. Clair County to the Maumee Hub near Toledo, Ohio, and those of CNG or Columbia from the Maumee Hub to the intersection with the Millennium pipeline in New York. This alternative would be significantly longer (214 or 286 miles longer, respectively) than the proposed route, disturbing significantly more land, wetlands, waterbodies, etc., than the proposed route. For this reason, we did no further analysis of the St. Clair/Detroit River Alternative.

### **Niagara River Alternative**

Millennium evaluated alternative routes that would begin at Dawn in Ontario, Canada, and would follow existing rights-of-way to the Niagara or Chippewa Import Points in the vicinity of Buffalo, New York. At the Canada/U.S. international border, they would cross the Niagara River adjacent to either the Tennessee or Empire pipelines. The total length of this route between Dawn, Ontario, and MP 143.8 in Allegany County, New York, would be between 292 and 307 miles (depending on whether the Tennessee or Empire pipeline was followed), as compared to the proposed route from Dawn to Greenwood, which would be about 250 miles (or between 42 and 57 miles shorter).

For our analysis, we evaluated a shorter route that would require Millennium to construct a new pipeline along the existing Tennessee and National Fuel rights-of-way, but would not use any of the existing pipeline facilities. The alternative would begin at the Canadian/U.S. border adjacent to Tennessee's Niagara Spur, would continue along Tennessee's pipeline to the Pekin Interconnection, and would then proceed adjacent to a National Fuel pipeline to the proposed route at MP 143.8 in Allegany County, New York. The new pipeline could deliver 8 dth per day to National Fuel at the Nash Road Delivery Point in Erie County, New York, for delivery to North East. It would transport the remaining 692 dth per day to the Millennium Project at an interconnection that could be constructed in Allegany County, New York. Gas could then be transported eastward as proposed.

The advantages of the Niagara River Alternative include the avoidance of the crossing of Lake Erie and the potentially shorter overland route in the U.S. (about 128.3 miles compared to the projects proposed total length of 143.8 miles). Another advantage is that the alternative would maximize the use of existing rights-of-way. About 93 percent of this alternative would be adjacent to existing right-of-way compared to about 78 percent of the proposed route. However, the disadvantages are that it would require about 14.1 more miles of onshore pipeline construction and would require Millennium to construct a new compressor station at the international border in Niagara County, New York. Further, we estimate that the Niagara River Alternative would cost about \$54,780,000 more than the replaced portion of the proposed route. Because it would not be cost effective and may increase environmental impact on land both in the U.S. and Canada (see discussion of Canadian alternative facilities in section 3.2.4.1), we did no further analysis of the alternative.



We received several comments about the feasibility of constructing a pipeline across Lake Erie. One of the major issues identified is the possibility of damage to the pipeline from ice scour (see section 5.3.3). Millennium completed and filed an ice scour study, which identifies where ice scour occurs and the trench depths that would be needed for pipeline burial. The COE completed an evaluation of Millennium's proposal and found no major issues with the technical feasibility of constructing the Millennium Project across Lake Erie.

### 3.3.1.2 Alternative Routes Across Lake Erie

Millennium based its selection of the proposed route across Lake Erie on identifying the shortest route and on the premise that potential impacts associated with land-based construction are greater than those associated with in-water construction. Originally, Millennium considered six alternative routes across Lake Erie. These were based on three landfall options on the Canadian side near the communities of Morpeth, Port Stanley, and Hemlock, and two landfall options on the U.S. side near the communities of Girard and North East in Pennsylvania. The landfall option near Hemlock was eliminated for commercial reasons. The landfall near Girard was also eliminated as it appeared to offer no advantages over the preferred U.S. landfall option near North East, the original (December 1997) route. Millennium later evaluated a U.S. landfall less than 4 miles north of North East at Ripley, the proposed (October 1998) route (see sections 3.4 and 6.3.1 for discussion of the Lake Erie Landfall variations).

Millennium states that two alternative crossings, Alternative A and Alternative B, were originally considered. Both originated at Dawn and extended to landfalls near Morpeth and Port Stanley, Ontario, respectively, and both extended to a landfall near North East, Pennsylvania. A number of factors, including route length, cost, scheduling, landfall location, offshore gas production areas, sediment quality, ice scour, anchor dragging, and turbidity generation and siltation were taken into consideration in evaluating Alternative A (Morpeth to North East) relative to Alternative B (Port Stanley to North East) as discussed below.

**Route Length** - Alternative A would be slightly longer (267 miles overall) than Alternative B (258 miles). However, the overland segment of Alternative A would be about 15.5 miles shorter. Since Alternative A would require less overland construction, Alternative A was preferred over Alternative B.

**Cost** - Although Alternative A would require considerably more offshore pipeline than Alternative B, costs would be about the same due to the greater costs of the longer Canadian overland segment for Alternative B.

**Scheduling** - The additional offshore length of Alternative A would affect overall construction scheduling, since marine vessel access to and from Lake Erie is restricted to a period between early April and November. Millennium estimated that the absolute longest installation season that could be expected is seven months, or about 210 working days. Based on an average production lay rate of 100 joints/day (e.g., about 4,000 feet per day), about 143 days would be required for pipe installation on Alternative A and about 111 days would be required for Alternative B. Although innovative approaches can be used to increase production, the risk of not completing pipe installation within one construction season is far greater for Alternative A. If pipeline burial requires multiple passes, or if severe storms hinder or preclude pipe installation, then this risk increases. Because there is a greater risk of not completing Alternative A in one season, Alternative B was preferred over Alternative A.

**Landfall Location** - Millennium proposes to install the pipeline at the landfalls on both sides of Lake Erie by horizontal directional drill. As a result, a number of issues were considered with respect to

landfall location. These included: population density in the immediate vicinity of the landfall; impact on any environmentally sensitive areas, or recreational lands or facilities; availability of sufficient land to accommodate the equipment required for the directional drill and pipe installation activities; and distance from the shore to the 23 to 26 foot depth contour. Based on these considerations, the landfall location near Morpeth (Alternative A) was slightly more advantageous than that near Port Stanley (Alternative B). The North East landfall was adequate for the proposed construction activities.

Offshore Natural Gas Development - There are a number of gas production fields along the Canadian shoreline, with some extending out as far as the international border. The pipeline collection systems for these fields have been installed on the lake bed with the wellheads protruding 5 ft above the lake bed. Alternative A would avoid the gas production areas and associated gas production facilities. Although Alternative B would also avoid most of the gas production areas, it would cross existing pipeline collection facilities at two to four locations. This would not have a major impact on the collection system, although the pipe would be cut just before installation of the Millennium pipeline and then reconnected after installation was complete.

Sediment Quality - Sediment quality is an important consideration for projects involving sediment disturbance (e.g., dredging, jetting). The occurrence of contaminated sediments along a proposed route would require the development of comprehensive (and costly) removal and disposal plans or may even preclude a particular routing. Therefore, those routes that are less likely to cross areas of known contaminated sediments are preferred. Generally, concentrations of heavy metals and toxic organics have declined in Lake Erie surficial sediments due to the decrease of contaminant loadings to the lake, particularly from industrial sources along the St. Clair and Detroit River systems. However, due to historic loadings, elevated contaminant concentrations still occur in the deeper sediments of the depositional basins in the lake. Alternative A would cross the depositional central basin where elevated contaminant levels occur in the deeper sediments. Alternative B would cross the Long Point-Erie sill where there has been less sediment accumulation.

Ice Scour - Ice scour has been documented in Lake Erie in water depths up to 82 feet. Both alternatives would cross areas with depths less than 82 feet. The potential for ice scour is generally higher along the nearshore, as well as in the western basin of Lake Erie. Alternative A was determined to have a greater susceptibility to ice scour because of its longer length, although this is likely offset by Alternative B's orientation nearer the Canadian shoreline.

Anchor Dragging - There are no officially designated anchorages for commercial vessels in the project area. During major storms, commercial vessels may drag their anchors as they seek temporary anchorage in sheltered or nearshore areas of the lake. Since the risk of pipeline damage from anchor dragging would be proportional to the length of the line in exposed locations, the preferred route would be that with the least length in commercial traffic areas of the lake. Alternative A would be longer and would parallel these commercial traffic areas for much of its length. Alternative B would cross the main commercial areas perpendicularly.

Turbidity Generation and Siltation - Although turbidity generation and siltation impacts are generally localized and short-term, overall impacts would depend on sediment particle size and the length of the route. Since Alternative A would be longer and would cross the depositional Central Basin with its accumulations of fine-grained sediments, Alternative B was considered preferable from the standpoint of turbidity generation and siltation.

Conclusion - Alternative A (Morpeth to North East) would be preferable from the standpoint of overland route length, landfall location, and offshore gas development. Alternative B (Port Stanley

to North East) would be preferable from the standpoint of scheduling, sediment quality, anchor dragging, and turbidity generation. Millennium states that based on this assessment, Alternative B was selected as the preferred route.

### 3.3.2 State Route 17 Alternatives

A number of comments (mostly on form letters) suggested an alternative that would place the proposed pipeline adjacent to or within the median strip of State Route 17, including, but not limited to the following segments: between the intersection of State Route 17 and the proposed pipeline at MP 111.3 (Olean) and MP 182.5 (Coopers Plains); between the intersection of State Route 17 and the proposed pipeline at MP 182.5 (Coopers Plains) and MP 287.3 (Hancock); and between the intersection of State Route 17 and the proposed pipeline near MP 287.3 (Hancock) and MP 369.6 (Tuxedo). Figure 3.3.2-1 shows the general location of each of these alternatives.

Millennium provided a preliminary environmental, engineering, and economic analysis for each of the three segments of the State Route 17 Alternative, and compared them to the corresponding segment of the proposed route. Because these routes would deviate from the existing Line A-5 corridor, construction of additional laterals would be required to maintain service to 23 existing and proposed delivery points of the Millennium pipeline, or the existing Line A-5 would need to remain in service (see figure 1.1-1 and table 2.1-2).

Further, State Route 17 follows a less direct route across New York than the proposed route, and therefore would require the construction of additional pipeline to reach the ultimate delivery point in Westchester County. Cumulatively, Millennium estimates that the State Route 17 Alternative would require construction of about 159.1 miles of additional pipeline, increasing impacts on all environmental resources. Since it would roughly parallel Millennium's proposed route, it would cross most of the same waterbodies and similar wetlands. Although there may be some advantage with placing the pipeline along a predisturbed road corridor, the additional 159.1 miles (41 percent of the proposed land route) would invariably result in added impacts, particularly in areas listed below where the pipeline would need to be routed around population centers. Further, the State Route 17 Alternative would not replace the initial segment of the project where the proposed pipeline would be installed primarily on new right-of-way (e.g., MP 32.9 to about MP 107.7) and would only replace that segment where the proposed pipeline would be installed adjacent to or within an existing pipeline right-of-way.

Millennium also identified preliminary routes for this alternative that would follow the south and east side of State Route 17. However, departures from the State Route 17 corridor would be common at interchanges, in urban areas, and in areas where the roadway is constructed immediately adjacent to streams, rivers, lakes, or wetlands. In many urban areas along Route 17, Millennium was unable to identify an alternative route based on existing mapping due to the current road configuration and the congested built environment. Specific areas of concern would be the towns of Cuba, Friendship, and Bath along the first segment (Olean to Coopers Plains); Corning, Horseheads, Elmira, Waverly, Endicott, Endwell, Johnson City, Binghamton, and Hancock along the second segment (Coopers Plains to Hancock); and Liberty, Monticello, and Middletown along the third segment (Hancock to Tuxedo). Further, construction practices required in urban areas would increase the amount of time required for installation of the pipeline, increasing traffic disruption and overall costs. Finally, Millennium estimates that construction of the State Route 17 Alternative (all 3 segments) would increase project costs by over \$200 million due to the construction of additional pipeline and associated construction limitations.



Because of the commercial and residential development along segments of the State Route 17 corridor, and the longer length (and additional pipeline construction) required to service delivery locations and avoid congested urban areas, we eliminated this alternative from further analysis.

### 3.3.3 Hudson River Alternatives

The proposed Hudson River crossing would entail the dredging of 2.1 miles within the Haverstraw Bay area of the Hudson River. The bay provides habitat for waterfowl and fisheries, including the federally endangered shortnose sturgeon and the Atlantic sturgeon, a federal candidate species, and is also a designated Significant Coastal Fish and Wildlife Habitat. Further, it is a designated Essential Fish Habitat (EFH) for seven fish species. Millennium proposes to cross the Hudson River between September 1 and November 15 to minimize fisheries impacts, including impacts on the shortnose sturgeon.

Therefore, we looked at other possible locations for a pipeline crossing of the Hudson River outside of the Haverstraw Bay area and identified two alternative locations, one north and one south of the proposed crossing. The northern alternative crossing would be about 3.3 miles north of the proposed crossing where the Algonquin pipelines cross the Hudson River in the vicinity of Stony Point. We evaluated two route alternatives to the north alternative crossing that would be adjacent to segments of the Algonquin pipeline and ConEd powerline rights-of-way. The southern alternative crossing would be about 11.3 miles south of the proposed crossing in the vicinity of the Tappan Zee Bridge. These alternatives are discussed in greater detail in section 6.1.

### 3.3.4 ConEd Alternatives

In its comments on the Millennium Project, the PSCNY and ConEd commented that their primary concern was the location of the pipeline within the ConEd powerline right-of-way in Westchester County, New York. Both alleged that an accident associated with construction or operation of the pipeline within this right-of-way would result in a power outage in New York City.

ConEd suggested that other routes be evaluated to avoid use of its right-of-way in Westchester County, New York. On March 21, 2000, we requested that Millennium resolve this issue with ConEd and the PSCNY. On June 28, 2000, Millennium filed an amendment (Docket No. CP98-150-001) to its pending certificate application to reflect a new proposed route (designated 9/9A Proposal) in Westchester County, New York. In response to numerous comments from residents that would be affected by the 9/9A Proposal, we evaluated three major route alternatives.

The first alternative is the original proposed route, where the pipeline would be placed within the ConEd powerline right-of-way (Original Proposed Route Alternative). The second alternative uses an offset alignment along the ConEd powerline right-of-way to State Route 100 and then continues south adjacent to State Route 100 to the 9/9A Proposal near MP 401.3 (ConEd Offset/State Route 100 Alternative). Both these alternatives were analyzed in the SDEIS. In comments on the SDEIS, the Villages of Croton-on-Hudson, Ossining, and Briarcliff Manor identified a third alternative that would use the ConEd offset segment of the ConEd Offset/State Route 100 Alternative and the Taconic Parkway instead of State Route 100. In subsequent discussions with ConEd and the PSCNY, Millennium and the PSCNY agreed to an acceptable placement for the pipeline along the edge of the ConEd right-of-way. Millennium then identified a proposed alignment along the Taconic Parkway. These two segments comprise the third alternative (ConEd Offset/Taconic Parkway Alternative). These alternatives are analyzed in section 6.2.

### 3.4 ROUTE VARIATIONS

Route variations differ from system or major route alternatives in that they are identified to resolve or reduce construction impacts on localized, specific resource issues, including wetlands areas, residences, landowner requests, and terrain conditions. While some variations are a number of miles in length, most are short and close to the proposed route. A number of factors are considered in identifying and evaluating route variations.

First, as described in section 3.3, Major Route Alternatives, primary consideration in identifying potential route variations is given to the use, enlargement, or extension of existing rights-of-way to avoid sensitive resources. Millennium's proposed route would be adjacent to existing rights-of-way for about 335.0 miles (87 percent of the land miles and 80 percent of its entire length). Many of the areas of new right-of-way were developed to reduce impact on specific resource areas, including agriculture, wetland and waterbody crossings. Other areas of new right-of-way would connect existing corridors along the proposed route and cannot be avoided.

Second, to comply with NEPA and section 404(b)(1) guidelines requiring analysis of the use of practicable alternatives that would eliminate or minimize the discharge of dredged or fill material into wetlands or other waters of the U.S. (40 CFR 230.10), we reviewed the need for route variations that would avoid or minimize disturbance to wetland resources. Because about 87 percent of the pipeline route would be constructed adjacent to existing rights-of-way, the need for clearing of forested wetland vegetation would be considerably reduced compared to the use of new right-of-way. Also, since placement of the pipeline adjacent to existing rights-of-way usually allows for some overlap of the existing cleared and maintained rights-of-way, some of the wetland areas that would be affected by construction of the Millennium pipeline are previously disturbed wetlands. Further, construction and operation of the pipeline would not result in any net loss of wetland habitat or functions, only the conversion of some portions of forested wetlands to emergent wetlands. As discussed in section 5.7, Wetlands, Millennium proposes to implement construction and restoration procedures that would minimize, to the extent practicable, impact on the wetlands that would be crossed. In addition, we have identified areas where minor modifications to the proposed route would minimize impact on NYSDEC-regulated wetlands (see section 5.7.3).

Third, we reviewed comment letters and the proposed route to identify other issues or concerns that warranted further analysis, as well as route variations that were identified after publication of the DEIS and/or in response to comments on the SDEIS (see table 3.4-1). These include minor variations on specific properties that were requested by landowners in their comments to avoid specific features, such as trees or springs. Variations that were considered but eliminated are discussed in section 3.6.2.

During the summer of 1998, Millennium identified 16 line changes in response to landowner, NYSDEC, and NYSDA&M concerns with the location of the proposed route as filed in December 1997. These line changes were included as parts of the proposed route in the updated alignment sheets and maps filed on October 27, 1998, and are analyzed as the proposed route in this FEIS. Also analyzed as the proposed route is the 9/9A Proposal as filed by Millennium in June 2000. Table 3.4-2 lists these line changes; the original route is shown in the maps in appendix B1 unless otherwise noted.

TABLE 3.4-1

## Route Variations Identified for Further Analysis

County	Variation Name	MPs	Section Where Discussed	Reason
Chautauqua	Lake Erie Landfall Variations	-	6.3.1	Minimize overall impact
	State Line	Landfall to 36.7	-	
	Forsyth Road	Landfall to 39.0	-	
Cattaraugus	Little Valley Variations	-	6.3.2	Reduce tree clearing
	Airport Variations	88.0 to 93.7		
	Hungry Hollow North/South	89.5 to 91.2		
	Coleman Variation	89.9 to 91.9		
Broome	Union Center Variations	-	6.3.7	Minimize overall impact
	Line A-5	232.4 to 243.5	-	
	Bradley Creek	241.1 to 242.6	-	
	Bradley Creek Road	241.7 and 242.0		
Broome	Micha Variations	-	6.3.8	Minimize agriculture and residential impact
	Micha Variation	243.4 to 244.7	-	
	Town Line Road Variation	243.0 to 244.0	-	
Westchester	Sprain Ridge Variations	--	6.3.15	
	Ridge Hill Variation	416.6 to 416.8		Commercial development
	Mosiello Variation	416.8 to 417.0		Residential
Westchester	Yonkers Variations		6.3.16	
	Catskill Aqueduct	418.3 to 420.1	--	Catskill Aqueduct crossing
	Parkway Variation	418.3 to 420.5	-	Residential
Westchester	Mount Vernon Variation	421.8	6.3.17	Tie-in with ConEd
--	Landowner Variations	-	--	-
Cattaraugus	Moore Variation	94.0 to 94.4	6.3.3	Sugar bush
Steuben	Grimins Variation	185.0 to 186.0	6.3.4	Residences and wells
Chemung	Moss Hill Road Variation	204.0 to 204.4	6.3.5	Residences
Chemung	Larison Variation	213.6 to 214.0	6.3.6	Sugar bush
Broome	Fava Variation	249.4	6.3.9	Shopping center
Orange	Bauer Variations A, B, C	302.5 to 303.0	6.3.10	Pond inlet
Orange	Trader Variation	314.4 to 314.5	6.3.11	Tree removal
Orange	Mission Land Road Variation	351.6 to 350.5	6.3.12	Black dirt area
Westchester	Briarcliff Commons	401.1 to 401.5	6.3.13	Residential
Westchester	Persico	408.7 to 409.9	6.3.14	Condominium complex

TABLE 3.4-2

## Line Changes Incorporated into the Proposed Route

County/ Line Change Description	Approximate Mileposts	Line Change Length (ft)	Original Route Length (ft)	Appendix B1 Sheet No.	Reason for Change
Chautauqua Ripley Landfall <u>a/</u> Bloomer Road	0.0 - 36.7 43.1 - 44.6	<u>a/</u> 8,850	<u>a/</u> 7,660	<u>a/</u> 5,6	Residents request to avoid vineyards. Avoid 2 residences on Bloomer Road.
Cattaraugus Buckeye	98.6 - 101.7	15,670	16,315	32,33	Avoid farm structures, 1 residence, and pond.
Potter	106.1 - 106.6	2,450	2,376	35	Avoid 1 residence. Improve constructability.
East Windfall Road	114.4 - 114.7	1,543	1,430	39	Avoid 4 residences on East Windfall Road.
Steuben McCormick	148.1 - 148.9	5,800	4,646	54,55	Landowner and NYSDA&M request. Reduce impact on agricultural land from 4.9 to 1.1 acres.
Ridge/Pease Road	149.5 - 149.9	2,700	2,482	55	Landowner and NYSDA&M request. Reduce impact on agricultural land from 4.3 to 1.3 acres.
Greenwood Cutoff	150.9 - 152.7	7,600	9,346	56	Landowner and NYSDA&M request. Reduce impact on agricultural land from 7.3 to 3.9 acres.
Chemung Beers Hill	195.8 - 197.1	8,050	6,917	76,77	Landowner and NYSDA&M request. Reduce impact on agricultural land from 4.6 to 2.3 acres.
Tioga/Broome Union Center <u>b/</u>	232.4 - 243.5	60,720	59,136	<u>b/</u>	Landowner and resident requests to avoid construction along Line A5.
Sullivan Mongaup	325.6 - 325.8	1,400	1,214	138	NYSDEC request to avoid timber rattler habitat.
Orange Pine Island Turnpike	349.9 - 353.3	21,840	17,952	149	Reduce impact on "black dirt" agricultural area.
Rockland Bowline Point	387.4 - 390.2	13,440	14,520	163,164	Landowner request.
Westchester Westchester County	405.1 - 408.7	18,650	19,166	170,171	Planning Commission request and improved constructability.
I-287	409.3 - 410.0	3,780	3,854	171	Planning Commission request and improved constructability.
Yonkers <u>c/</u>	417.2 - 421.3	21,570	21,226	173-175	Avoid construction adjacent to the Bronx River Parkway.
9/9A Proposal <u>d/</u>	391.2 - 416.6	22.7 mi	23.6 mi	164-171	Avoid construction within the Con Ed powerline right-of-way

a/ See discussion and maps in section 6.3.1, Lake Erie Landfall Variations.b/ See discussion and maps in section 6.3.7, Union Center Variations.c/ See discussion in section 6.3.16, Yonkers Variations.d/ See discussion in section 6.2, Con Ed Alternatives in Westchester County.

### 3.5 REPLACEMENT ALTERNATIVES

Millennium proposes to develop the Millennium Project by: (1) installing new pipeline segments adjacent to newly abandoned segments of the Line A-5 in the central portion of New York (MPs 154.3 to 285.6 in Steuben, Chemung, Tioga, Broome, and Delaware Counties); and (2) installing new pipeline in generally the same location as the abandoned and removed Line A-5 in the eastern portion of New York (MPs 285.6 to 376.4 in Delaware, Sullivan, Orange, and Rockland Counties). We evaluated two alternatives associated with construction of that segment of the proposed route that would be constructed adjacent to Line A-5: the Same Ditch Replacement Alternative and the Pipeline Placement Alternative.

#### 3.5. Same Ditch Replacement Alternative

We received a number of comment letters requesting an alternative that would require Millennium to construct the new pipeline in the same location as the Line A-5 between MPs 154.3 and 285.6, or those areas that the Line A-5 would be abandoned in-place. This “same ditch” replacement alternative would reduce impacts associated with right-of-way acquisition and expansion by minimizing clearing and grading and containing land use impacts in Steuben, Chemung, Tioga, Broome, and Delaware Counties.

Millennium states that the segment of Line A-5 that is proposed for in-place abandonment is between the Greenwood Compressor Station (MP 157.9) and Hancock Measuring Station (MP 285.6). This segment of pipeline would need to remain in service during construction of Millennium’s proposed facilities to permit Columbia to continue to provide all of its certificated firm transportation and storage services for 17 Line A-5 shippers whose delivery points are on that section of the pipeline. In addition, Columbia states that it would retain rights to the pipeline and the right-of-way for other possible future uses or for use by others. Millennium would not acquire rights to this pipeline as part of this project. Since these facilities would need to remain in service during construction, we did no further evaluation of this alternative. The procedures Columbia would use to abandon this segment of Line A-5 in place are described in section 2.3.2.

#### 3.5.2 Pipeline Placement Alternative

Millennium originally proposed a 50-foot offset from Line A-5 between MPs 154.3 and 285.6. In response to comments received during scoping, we requested that Millennium evaluate reducing the offset of the proposed pipeline from 50 feet to 25 feet. Millennium agreed to construct this segment of the pipeline generally using a 25-foot offset, except for 56 areas that would require additional separation to avoid site-specific resources (e.g., residences) or to facilitate construction in wetlands, streams, road crossings, or along steep slopes (see table C1 in appendix C for the location by milepost). Because Millennium has committed to installing the proposed pipeline with a 25-foot offset for the majority of this section, and these limited site-specific areas account for only about 7.9 miles (6 percent) of the distance between MP 154.3 and 285.6, this alternative is now part of the proposed project.

### 3.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

In addition to the alternatives described above, a number of other potential major route alternatives and route variations were identified in Millennium’s application or in public comments on the project. Although we reviewed each of these alternatives and variations to determine if they were viable, we concluded for various reasons that they were either impractical or offered no significant environmental advantage over the proposed route as discussed in the following section.

### **3.6.1 Major Route Alternatives**

#### **Norfolk/Southern and CSX Railroad Alternative**

A commenter (Priebe) in North East, Pennsylvania, suggested that the proposed pipeline follow the existing Norfolk/Southern and CSX railroad rights-of-way along the lake plain and then east toward the ultimate delivery points. We identified a railroad right-of-way that continues north along Lake Erie to Buffalo, before turning east across northern New York, about 60 miles north of the proposed route. We also identified a number of other railroad rights-of-way in the project area, but found them to be oriented in a generally north-south rather than a west-east direction which would require numerous connecting segments of new right-of-way between railroads. Because the railroads service urban areas, pipeline construction would be required in urban areas, and additional pipeline miles would be required to reach the ultimate delivery point in New York City. Further, deviation from the existing Line A-5 right-of-way would require the construction of additional laterals to service Columbia's existing customers. Since the potential for environmental impacts associated with the longer length and construction through urban areas would be increased, we eliminated this alternative from further analysis.

#### **Horseheads Alternative**

A commenter (Cullings) in Horseheads, New York, identified two alternative routes that would begin in the Horseheads, New York, area at about MP 202.0. The first route, Horseheads Alternative A, would extend northeast along an existing pipeline corridor for about 0.8 mile, crossing the Veteran town line and State Route 13 and then turning east-southeast on new right-of-way, passing north of the town of Erin, to rejoin the proposed route at about MP 216.0. Our review indicates that the Horseheads Alternative A would be about the same length as the proposed route, but would require about 13.2 miles of new right-of-way in previously undisturbed, mostly forested areas.

A second route, Horseheads Alternative B, was also suggested that would deviate from the proposed route at about MP 202.0 and turn south following the State Route 13 and the State Route 17 rights-of-way east of Elmira, then turning northeast at a point north of Wellsburg, and continuing northeast to rejoin the proposed route at about MP 216.0. Our review of this route indicates that the Horseheads Alternative B would be about twice as long as the corresponding segment of the proposed route (about 28 miles versus 14 miles), and would require the establishment of about 14.3 miles of new right of way in previously undisturbed, forested terrain.

Since we identified no site-specific issues or concerns with the proposed route in this area, which would be adjacent to Columbia's existing Line A-5 right-of-way, and both alternatives would require establishment of significant new right-of-way through previously undisturbed, forested terrain, we eliminated these alternatives from further analysis. However, in consultation with affected landowners in this area, Millennium identified the Moss Hill Road Variation (MPs 204.3 to 204.4) that would resolve some of the concerns of the residents in this area (see discussion of the Moss Hill Road Variation in section 6.3.5).

#### **Palisades Park Alternative**

We received several comments regarding the use of route variations between approximate MPs 364.0 and 386.0 through property managed by the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) and the Palisades Interstate Park Commission (PIPC). These properties include the Sterling Forest (MPs 364.9 to 366.1), Harriman (MPs 369.9 to 375.7), and High Tor (MPs 385.0 to 385.3) State Parks. Between MPs 364.0 and 376.4, the proposed pipeline would be installed in the Line A-5 ditch, following abandonment and removal of the existing Line A-5. Between MPs 376.4 (Ramapo Station) and 383.1 (Buena Vista Station), Millennium would acquire and use the existing Line 10338 pipeline, and there

would be no land disturbance. Between MPs 383.5 and 386.0, the pipeline would be installed adjacent to an existing 250-foot-wide powerline right-of-way.

Therefore, any potential route alternatives in this area would be between MPs 364.0 and 376.4 or MPs 383.5 and 386.0 to allow for the tie-in to the Ramapo and Buena Vista Stations. Any route alternatives would require the creation of new right-of-way. Unless there are significant environmental resources along the proposed route that would warrant avoidance, we believe the “lift and lay” method of construction would have the least environmental impact because it would mostly confine construction to previously disturbed areas (e.g., the existing Line A-5 right-of-way). Also, see discussion below for the Doris Duke Wildlife Sanctuary in section 3.6.2. For the segment in the High Tor State Forest, construction adjacent to the existing right-of-way would be preferable to any new right-of-way, including new right-of-way around the park. Since the proposed route would follow existing utility corridors and would minimize new impact and no significant or unique environmental resources have been identified, we eliminated this alternative from further consideration.

### **Route 117 Alternative**

A coalition of concerned citizens (Not Under My Backyard [NUMB]) opposed to the ConEd Offset/Taconic Parkway Alternative (see section 6.2.6) identified the Route 117 Alternative that would replace all but the last 1.3 miles of the ConEd Offset/Taconic Parkway Alternative. This alternative would begin at approximate MP 385.0 at the Long Path Trail in the High Tor State Park in Rockland County. The pipeline would be installed within or adjacent to the Long Path Trail past Little Tor and High Tor scenic areas to the end of the trail and the park near the Tilcon quarries. From there, the alternative would continue along a series of dirt roads, including Scratchup and Long Clove Roads, through the quarry area to Route 9W and an abandoned road in Hook Mountain State Park (Hook Mountain Bike Trail) that is marked with a historical marker for Snedekers Landing. The alternative would follow the trail (a distance of about 5 miles) along the Hudson River to Nyack Beach State Park, where it would cross the Hudson River to the Rockefeller State Park Reserve. The alternative would cross four electric railroad lines at the river’s edge, then cross through the open fields of the reserve to State Route 117 and continue east-northeast adjacent to State Route 117 to the intersection with the proposed route near MP 403.5.

The Route 117 Alternative would require a 2.5-mile-long crossing of the Hudson River within the southern part of Haverstraw Bay, about 2.8 miles north of the Tappan Zee Bridge. The alternative would be about 22 miles long, or about 3 miles longer than the proposed route. We reviewed this alternative in the field from MP 403.5, along State Route 117 to the east and west sides of the Hudson River crossing. Four tracks of an active, electric railroad are located adjacent to the east bank of the Hudson River in this area. Since the railroad cannot be taken out of operation or the rails removed and replaced, any crossing of the Hudson River in this vicinity would require a directional drill or a bore under the railroad and out into Hudson River and Haverstraw Bay. If a directional drill were used, bentonite would be released into Haverstraw Bay and the EFH. If a bore were used, it would be extremely difficult to connect the pipeline that is crossing the river (e.g., open cut) to the pipeline that is bored under the railroad track.

On the west side of the river, the landing would be within the Nyack Beach State Park where work space is limited by cliffs that approach to within 100 feet of the river and a building that marks Hook Mountain and Nyack Beach State Park as a National Natural Landmark. The Hook Mountain Bike Trail that extends north from Nyack Beach is paved and about 10 feet wide, and winds along the river. It is bordered by steep cliffs on west side and 5 to 6 feet of rock riprap on the east side along the Hudson River. The High Tor and Hook Mountain State Parks are part of the Palisades Interstate Parks system.

We identified three major issues with this alternative. First, a directional drill under the railroad tracks and into the Hudson River, if it is feasible, would require release of drilling fluids (e.g., bentonite)

onto the river bottom. Since this crossing would still be within designated EFH habitat and would be longer than the proposed route, we identified no advantage with the alternative over the proposed route. Second, installation of the pipeline along the winding Hook Mountain Bike Trail would require cutting back the adjacent cliffs and trees on the west side of the trail to provide enough working space for equipment to excavate the trench, maneuver pipe into position, and backfill the trench. There is virtually no useable work space on the Hudson River side of the trail. Third, installation of the pipeline within the Palisades Interstate Park system may not be a compatible use. It would require clearing trees along its length which would have a significant impact on the viewshed of the Hudson River. This impact may not be consistent with the CZM Plan. For these reasons, we eliminated this alternative from further analysis.

### **3.6.2 Route Variations**

#### **North East Landfall Variation**

A commenter (Smith) from Ripley, New York, suggested a variation that would make landfall in North East, Pennsylvania, just south of the Lake Side Golf Course, continue across several open parcels to Interstate (I)-90, and then follow I-90 north to Shorman Road. After crossing Shorman Road, the variation would turn east, cross I-90 between the toll booth and State Route 76, cross State Route 76 and property owned by the town of Ripley, and continue east to the Forsyth Road Variation (see section 6.3.1). The variation would then follow the Forsyth Road Variation to the proposed route at MP 39.0. We find that the proposed route and Forsyth Road Variation are preferable because they would be shorter on land, would affect fewer resources, and we found no significant impact from the proposed route. Therefore, we eliminated this variation from further analysis.

#### **Hagerdon Hill Road Variation**

A commenter (Buldas-Zinner) in Ellington, New York, requested a route variation using Hagerdon Hill Road to avoid a large stand of mature pine trees between the road and two residences at MP 67.7. Millennium currently proposes to deviate north from Columbia's existing pipeline right-of-way after crossing Hagerdon Road and to continue east through an agricultural field (and around the woodlot) before returning to the Line A-5 corridor at about MP 68.0. We find that the landowner's concern has been resolved with the change to Millennium's proposed route, and we eliminated this variation from further analysis.

#### **Williams Variation**

A landowner (Williams) in Little Valley, New York, commented that nearly half (about 46 percent) of the new right-of-way would be in Cattaraugus County. As proposed, the pipeline would cross land near Whig Street MP 89.9 that has been owned by his family since the 1840's. To avoid these parcels as well as the large natural rock formations (known as "Rock City"), he suggested a route variation that would begin at MP 88.0 and turn south adjacent to an existing pipeline right-of-way that is in turn adjacent to an abandoned railroad. The variation would continue south for about 2.3 miles before turning east to parallel the Little Valley-Salamanca boundary to Great Valley and then rejoining the proposed route at approximate MP 96.1. Preliminary review of this route indicated that it would be adjacent to existing rights-of-way for 2.3 miles more than the proposed route and would cross 3.0 fewer miles of forest. However, the variation would be nearly 1 mile longer than the proposed route and would cross 14 streams, twice as many as the proposed route. The variation would require three crossings of Little Valley Creek and one crossing of Great Valley Creek, which are about 45 feet wide at the crossing. The proposed route would cross only one stream of this width, Great Valley Creek. Because of the additional length and the increased number of stream crossings, we eliminated this variation from further consideration at this time. However, we did analyze four other variations in this area (see section 6.3.2, Little Valley Variations).

### **Nichol Variation**

One landowner (Nichol) commented that the pipeline would cross two parcels of his property, which he states are both heavily timbered with prime hardwood timber not quite ready to harvest and are on new right-of-way (MPs 90.7 to 90.8 and 91.1 to 91.2). Of particular concern to the commenter is the presence of large natural rock formations (“Rock City” formations) with locally recognized archeological, historical, scenic, and recreational value that would be destroyed by pipeline construction. The commenter requested that a route variation be identified to avoid impact on these unique rock formations. This property is remote and can only be accessed from Little Rock City Road. Millennium states that the landowner has not granted survey permission and that aerial photography is not sufficient to verify the location of rock formations or to assess the need for mitigation that might include a route modification. Because we were unable to access these parcels or clearly determine from the air if the rock formations would be affected, we eliminated this variation from further consideration at this time. However, we have evaluated four variations in this area (see section 6.3.2, Little Valley Variations).

### **Five Mile Road Variation**

A landowner (Bryer) in Allegany, New York, commented that the proposed pipeline would be close to the new Allegany-Limestone High School, which is currently under construction near MP 106.0 and suggested that the pipeline be moved further away from the school along the Niagara Mohawk powerline. Preliminary evaluation of a route variation that would deviate from the proposed route at about MP 105.2, and continue east for about 1.7 miles on new right-of-way before turning south along the Niagara Mohawk powerline to rejoin the proposed route at MP 108.5 indicated that this variation would be about 0.4 mile longer than the corresponding segment of the proposed route. Based on our review of the information provided, the school would be about 0.6 mile from the proposed route, which would be more than adequate from a public safety standpoint. Therefore, we did no further analysis of a route variation in this area at this time.

### **Kuzel Variation**

A landowner (Kuzel) in Union, New York, commented that the proposed pipeline would be about 250 feet south of his residence at MP 247.1, and proposed a variation further south across an adjacent agricultural field. He was concerned about the proximity of the pipeline to his residence because Columbia’s Line A-5 had ruptured in 1993 in this area, destroying a residence on the adjacent property. We have found no environmental advantages associated with the Kuzel Variation compared with the corresponding segment of the proposed route. While we recognize the perceived safety concern of placing the pipeline near residences, the USDOT standards developed for the pipeline industry, with respect to the design and operation of these facilities, provide adequate margins of safety to protect the public. Operation of a new pipeline on any route would meet all required safety standards and would ensure adequate protection for the public. Therefore, we eliminated this variation from further consideration.

### **Neversink River Variation**

The Nature Conservancy commented that the proposed crossing of the Neversink River at about MP 340.8 in Orange County could affect known populations of the federally endangered dwarf wedge mussel. Millennium identified dwarf wedge mussel habitat between 1,000 and 1,800 feet downstream of the proposed crossing and evaluated alternative routes and alternative construction techniques to minimize impacts. Alternative routes for the crossing of the Neversink River must consider two constraints: first, because the existing Huguenot Meter Station is a point of delivery for a local distribution company, any alternative route must originate from the station or downstream of it; and second, any alternative route must pass to the south of the Neversink Road Bridge to avoid known populations of the dwarf wedge mussel.

Alternative crossings that satisfy the above siting criteria would require the construction of additional pipeline and would likely result in additional environmental impacts. These impacts would result from the crossing of an additional tributary to the Neversink River, construction disturbance in a location with high probability for the presence of cultural resources, the creation of a new right-of-way through a developed area adjacent to U.S. Route 209, and the disruption of facilities associated with the New Hope Farm Equestrian Training Center located on both sides of Neversink Road above the bridge. Finally, any newly established crossing location would require clearing of mature vegetation on both river banks.

We also asked Millennium to consider using the existing 24-inch-diameter pipeline between approximate MPs 340.0 and 348.0. Millennium responded that use of the existing pipeline (with a MAOP of 900 psig), in lieu of the new, 36-inch-diameter pipeline (with a MAOP of 1,440 psig), would impose restrictions that would reduce both pipeline capacity and pressures for shippers, almost all of which have requested delivery points downstream of the Neversink River. To offset the restrictions and maintain service at the requested levels and pressures, Millennium would have to add 2,000 hp of compression (\$6 million), and build an aboveground regulating station (\$400,000) and a launcher/receiver (\$1.2 million) where the pipeline changes diameter. It would also be necessary to increase the delivery pressure at the origin to 1,466 psig and to redesign the pipeline to the higher operating pressure. The 24-inch-diameter pipe would also artificially limit future expansion of the system.

Millennium's proposed crossing of the Neversink River (adjacent to the existing Line A-5) would minimize the amount of new permanent right-of-way, the total length of the pipeline, and land use impacts. Further, Millennium proposes to cross the Neversink River using a dry construction (e.g., conventional bore) technique to avoid impact on downstream populations and habitats of the dwarf wedge mussel and would relocate any mussels in the construction work area before construction. Because the proposed crossing location and construction techniques, along with our recommended mitigation measures (see section 5.6.2), would be adequate to protect existing habitat and populations of the dwarf wedge mussel in the Neversink River, we did no further analysis of this route variation.

### **Orange County Railroad Variation**

A landowner in Warwick (De Buck) identified the Orange County Railroad Variation to reduce impact on the black dirt area. The variation would begin at about MP 351.6 and would turn northeast along an existing road to an abandoned railroad. It would then follow the railroad across Pochuck Creek, turn south and then east across black dirt farms to rejoin the proposed route at approximate MP 352.7. Millennium stated that the abandoned railroad is potentially eligible for listing on the NRHP and that the variation would cross through a proposed historic district in which 11 structures would be within 50 feet of the construction work area. In addition, the variation would add about 1,183 feet to the overall length of the pipeline, would cross longer sections of black dirt area, and would intersect 11 secondary drainage ditches. Because impacts would be greater on the black dirt area and the drainage ditches and other better variations were identified, we eliminated this variation from further consideration.

### **Doris Duke Wildlife Sanctuary Variation**

We received comments from the NYOPRHP and the PIPC that land recently acquired for the jointly managed Sterling Forest State Park includes a crossing of the Doris Duke Wildlife Sanctuary (MPs 364.9 and 365.8). Although both agencies recommended that alternative routes be evaluated to avoid the sanctuary, neither identified a specific route variation.

The Sterling Forest State Park consists of 15,280 acres of woodlands. Of this amount, 1,400 acres, in the northern portion of the park, have been set aside as the Doris Duke Wildlife Sanctuary. Millennium's currently proposed route would cross about 0.7 mile of the southern portion of the sanctuary and 4.0 miles

of the state park. The lift and lay construction method would be implemented through these areas within existing right-of-way.

Millennium evaluated route variations to the north and south of its currently proposed route. A route variation to the north would require crossing northern portions of the state park, the Appalachian Trail (AT), and Harriman State Park on new right-of-way to the interconnection with the Ramapo Meter Station. Millennium indicated that the AT could potentially be crossed at two locations on this alternative. A route variation to the south would also require new right-of-way within the Sterling Forest State Park or within the Ringwood State Park in New Jersey. Based on our review of available maps, a reroute to the south could require a longer crossing length within state park property. As proposed, the AT crossing would be at a location already effected by Columbia's pipeline and would not be a new utility crossing. Because the proposed crossing location and construction techniques would minimize impacts on both the Sterling Forest State Park and the Doris Duke Wildlife Sanctuary, we eliminated this variation from further consideration.

### **New City Variation**

Several commenters (Maxton-Graham and the West Branch Conservation Association) in New City, New York, suggested that the pipeline should follow an alternative route in the vicinity of MP 383.9 to avoid a residential district that contains homes designed by architect Henry Varnum Poor. The commenters did not identify a specific route variation. The proposed pipeline route would be within Red Rock Road or adjacent to an existing powerline in this area. In addition, Millennium has modified its construction work area in the vicinity of these residences (see additional discussion of these properties in section 5.9). Therefore, we find that construction impact would be minimized, and we eliminated this alternative from further analysis.<sup>24/</sup>

## **3.7 ABOVEGROUND FACILITY ALTERNATIVES**

Millennium proposes to construct and operate three new measuring and regulating stations. In assessing alternatives for these stations, we considered factors such as loss of prime farmland, land use compatibility, wetland disturbance, presence of critical habitat or endangered and threatened species, and the presence of NRHP-eligible cultural resources. The Ramapo Station would be constructed on the site of an existing station, which would be removed, the Mount Vernon Station would be constructed in a parking lot, and the Wagoner Station would be constructed in a forested area adjacent to Columbia's Milford Compressor Station. These sites have been previously disturbed, or in the case of the Wagoner Station, would be adjacent to an existing industrial facility. In general, the use of previously developed sites is more environmentally acceptable than the development of a new site where existing land uses would be permanently altered. Since we found no significant environmental concern associated with construction at the Ramapo and Wagoner Stations and we received no comments about their locations, we did not consider the use of alternative sites.

However, we received numerous comments about the location of the Mount Vernon Station at the terminus of the pipeline in Mount Vernon, New York. As originally proposed, the pipeline would have interconnected with ConEd at the intersection of West 4th Street and South 8th Avenue. As currently proposed, the Millennium 24-inch-diameter pipeline would interconnect at ConEd's existing 20-inch-diameter at West 4th Street and South 7th Avenue (see section 6.3.17). The Mount Vernon Station would be located at MP 420.6 in an industrial/commercial building parking lot and about 1.2 miles from the interconnection with ConEd.

<sup>24/</sup>

On March 29, 2001, the PSCNY authorized Hudson Valley Gas Corporation to construct a 24-inch-diameter pipeline between the Buena Vista Station (MP 382.5) and the Bowline Power Plant (MP 387.4). See section 1.4.

Millennium originally identified two block valves in floodplains at MPs 95.9 and 387.7. The valve at MP 95.9 has been relocated to MP 96.9 out of the floodplain (see table 2.1-1). The valve at MP 387.7 would be in the vicinity of the Bowline Power Plant on the west shore of the Hudson River. This valve would be the designated connection point for gas service to this facility and cannot be moved. Since the valve would not change the flood storage capacity in this area, we do not believe that it requires relocation. The FWS, in its comments on the DEIS, commented that the valve near the Mongaup River would be in a floodplain. Although this valve would replace an existing valve and is not in a floodplain, Millennium has relocated the valve further east to MP 330.3 (see table 2.1-1).

A commenter in Johnson City, New York (Supa) stated that Millennium had overlooked the possibility of constructing a new metering station and tap to the Seneca Lake Natural Gas Storage field near MP 194.4 and that the existing metering and regulating stations at MPs 240.2 and 241.8 should be used rather than requiring construction of new facilities along the proposed route in the segment between MPs 232.4 and 243.5 (Union Center area). The commenter contended that these recommendations would be in agreement with the Commission's and Millennium's objectives to provide extensive and flexible service options. We have no knowledge of any proposal requesting the construction and operation of a metering station at MP 194.4 or if such construction would serve the purpose of either Millennium or the Seneca Lake Storage Project. According to the commenter, the Seneca Lake Storage Project is sponsored by NYSEG, which may be permitting the project under state rather than FERC regulations. If either NYSEG or Millennium determine that a metering station or tap should be installed at this location, the proposal would be subject to the appropriate federal and state review.